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ORIGINAL ADDRESSES.

INTERNATIONAL UNIFORMITY IN ARMY MEDICAL STATISTICS.

An Address delivered before the Section of Military Hygiene, Tenth International Medical Congress, Berlin, August 7, 1890.

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(Concluded from page 134.)

IT is impossible to publish the data for each individual form of the thousand and more varieties of disease which medical officers are called on to record, since to do so would occupy far more space than the amount of information thus obtained by the public would justify. We must, therefore, group the great majority of them according to some nosological system of classification; and herein lies one of our greatest difficulties. There is no uniformity in the system of classification in use in different armies, and there is no system which is satisfactory to one who is familiar with the recent advances in pathology. Even as regards the nomenclature of causes of death, the terminology of which is much more limited than that which must be used by the army medical officer in recording cases of disease, there is no uniform classification adopted in different countries. That it is very desirable to secure uniformity in nosological arrangement is admitted by every one; but is it possible to accomplish it? In attempting to answer this question we must fully recognize the difficulties which exist in each country in the way of changing its present methods.

In the first place, it is desirable that the classification for each army shall be such that its results can be compared with those given in previously published medical statistics of the same army, and also, with the published mortality statistics of its own country. Any changes, therefore, which render such comparison impossible are undesirable.

In the second place, it is admitted that no system of nosology at present in use is satisfactory, and, therefore, if an absolutely uniform system is to be prepared and adopted it will require a change in the form of statistics of every country, and these changes should affect the forms in which the mortality statistics of civil life are published, as well as those of armies and navies.

Taking all these facts into consideration, as well as the general characteristics of human nature which lead a man to think that his own plans, or the system of his own country is the best—which characteristics affect those having charge of the organization of army medical departments very much as they do other men—and also the fact that in view of recent discoveries it would be unwise at present to attempt to classify from the etiological point of view quite a number of forms of disease, it seems evident that it is not worth while now to attempt to secure a uniform and rigid system of nosological classification. When, however, we come to consider the forms of disease which are of the most frequent occurrence and which cause the greatest amount of disability and loss of life in armies, we find that it is not so difficult to suggest a system which will permit of comparison of the more important facts in the statistics of different armies.

If the data are given for each of the individual forms of disease above specified, we shall find that most of the more important difficulties have been practically overcome. For example, diarrhœas are included under one classification of diseases of the digestive organs, and in others in one of the sub-groups of the general diseases. In one classification phthisis pulmonalis is given under diseases of the respiratory organs, in another under the group of tubercular diseases, which in turn are classed with rheumatism. Tetanus is usually given under diseases of the nervous system, but if a new nosology were now to be constructed it would probably be placed with specific infectious diseases. Diabetes, or glycosuria, appears in one classification under diseases of the digestive system, in another under diseases of the urinary organs, in another under diseases of the nervous system, and in still others under the heading of general diseases. But if the data for each of these forms of disease are given separately it is possible to make all the comparisons which are desirable between the statistics arranged in these widely different forms of classification. The chief difficulty, of course, occurs in the class of what are termed general diseases. If we can agree upon the groups into which these are to be divided, and as to what each group shall include, there is little difficulty in arranging a scheme for the classification of the local diseases. Among these general diseases the statistics of the following should be given separately from any system of classification whenever they occur among the troops, viz., cholera, yellow fever, plague, spotted typhus, relapsing fever, cerebro-spinal fever, diphtheria, tetanus, and specific influenza, or grippe. Excluding these from the grouping in addition to the specially important individual forms of diseases previously considered we should have groups of the so-called general diseases something like the following:

1. Acute contagious fevers, including more especially the ordinary eruptive fevers, such as measles, scarlet fever, and rötheln.

2. Septic diseases, due to pyogenic bacteria or their products.

3. Tubercular diseases, including all forms, with the exception of phthisis pulmonalis, which is to be given separately.

4. Diseases due to animal parasites, such as trichinæ, worms, etc.

5. Diseases derived from animals or so-called zoögenous diseases—glanders, anthrax, etc.

6. Tumors and new growths.
7. Debility and other unknown or vague causes.

The classification of the local diseases would then be the usual one, excluding as before the individual diseases of special statistical interest. It would include diseases of the nervous system, of the respiratory system, of the circulatory system, of the digestive system, of the genito-urinary system, of the absorbent system, of the locomotor system, of the eye, of the ear, of the nose and throat, and of the integumentary system.

Let us now see how far it would be possible to obtain data, in accordance with the individual items and groups of this classification, from the army medical statistics heretofore published. This is shown by the following table:

DISEASES AND GROUPS OF DISEASES GIVEN IN DIFFERENT ARMY MEDICAL REPORTS.

	Austrian army.	Bavarian army.	Belgian army.	British army.	French army.	German army.	Italian army.	Netherlands army.	U. S. army.
Smallpox	×	×	×	×	×	×	×	×	×
Enteric or typhoid fever	×	×	×	×		×	×	×	×
Acute contagious fevers		×	×	×		×		×	×
Diarrhœa			×					×	×
Dysentery	×	×		×	×	×		×	×
Malarial fever	×	×	×	×	×	×	×	×	×
Venereal diseases	×		×				×	×	
Primary syphilis		×	×	×	×	×			×
Secondary syphilis			×						×
Gonorrhœa		×	×	×					×
Septic diseases		×		×					×
Pulmonary phthisis	×	×	×		×	×	×	×	×
Tubercular diseases				×			×		
Rheumatism	×	×	×	×	×	×	×	×	×
Diabetes and glycosuria		×	×			×			
Scurvy	×	×		×	×	×	×		
Alcoholism	×	×	×	×	×	×			×
Tumors and new-growths	×				×				
Malignant tumors	×	×			×	×			
Diseases due to animal parasites	×	×				×			×
Diseases from animals (zoögenous)			×						
Debility and other unknown or vague causes									
Mental disorders	×	×	×	×	×	×			
Suicide	×	×	×			×			
Diseases of the nervous system	×	×	×	×	×	×			×
Tonsillitis	×	×				×			×
Bronchitis	×	×	×			×	×	×	×
Pneumonia	×	×	×			×	×	×	×
Diseases of the respiratory system	×	×	×	×	×	×		×	×
of the circulatory system	×	×	×	×	×	×			×
of the digestive system	×	×	×	×	×	×		×	×
of the genito-urinary organs	×	×	×		×	×			×
of the absorbent system			×	×					
of the locomotor system	×	×		×		×			×
of the eye	×	×	×	×	×	×	×	×	×
of the ear	×	×	×		×	×			×
of the integumentary system		×	×	×	×	×	×	×	×

The Belgian, British, Italian, Netherlands, and United States reports give only the number "admitted;" the Bavarian, French, and German reports give the number "admitted" and "total treated;" the Austrian report gives the "total treated" only.

Thus far, for the sake of simplicity, we have been speaking of the statistics of diseases only, not including injuries, and of those used in regular periodical reports in time of peace and not of those employed in setting forth the medical history of a campaign or war. As regards the general class of injuries and wounds of all kinds, the classification used in the regular periodical reports of the different armies is shown in the following table, the combinations with other data being substantially the same as those used in connection with the different diseases.

TABLE SHOWING INJURIES REPORTED FOR ARMIES IN REGULAR REPORTS IN TIMES OF PEACE.

	Austrian.	Bavarian.	Belgian.	British.	French.	German.	Italian.	Netherlands.	United States.
Burns		×	×			×			
Contusions			×				×		
Contusions and lacerations		×				×			
Contusions and sprains									×
Dislocations	×	×	×			×			×
Excoriations			×						
Fractures (not gunshot)	×	×				×		×	×
Fractures (including all)			×				×		
Frostbite	×	×	×			×			×
Heatstroke									×
Incised, lacerated and contused, and punctured wounds									×
Incised, punctured, and bit wounds		×				×			
Injuries					×				
Injuries, general				×					
Injuries, local				×					
Injuries, received in action				×					
Lacerations			×				×		
Luxations								×	
Shot wounds	×	×				×			×
Sprains		×				×			
Wounds (not including injuries)		×	×					×	
Sore from riding or walking		×				×			
Other injuries			×						×

The forms of statistics of wounds and injuries occurring in a campaign or war which have heretofore been given on the most extensive scale, are contained in the reports of the French Army in the Crimea, 1854–56, the British Army in the Crimea for the same period, War of the Rebellion, United States, 1861–65, and the statistics of the Franco-German war published by the medical department of the German army, for 1870–71. The data or combinations of data given in these reports with regard to wounds and injuries are indicated in the following table:

WOUNDS AND INJURIES.

	French in Crimea.	British in Crimea.	German army 1870–71.	U. S. army 1861–5.
Injuries of head	×	×	×	×
of face	×	×	×	×
of eyes	×		×	
of lower jaw	×			
of neck	×	×	×	×
of back and spine	×	×	×	×
of chest	×	×	×	×
of abdomen	×	×	×	×
of pelvis				×
of sacro-lumbar region	×			
of iliac region and buttocks	×			
of inguinal region	×			
of perineum and genito-urinary organs		×		
of genital organs	×	×		×
of ano-perineal region	×	×		
of shoulder	×	×		×
of arm	×	×		×
of elbow-joint	×	×		×
of forearm	×	×		×
of wrist-joint	×	×		×
of hand and fingers	×	×		×
of hip-joint	×	×		×
of thigh	×	×		×
of knee-joint	×	×		×
of leg	×	×		×
of ankle joint	×	×		×
of foot and toes	×	×		×

Data beyond *abdomen* not yet published.

Each group subdivided according to nature of weapon: 1, punctured and incised wounds; 2, shot wounds; 3, other injuries. And, again, according to parts injured, in: 1, flesh wounds; 2, fractures.

Giving for each class also—complications, sequelæ, and operations.

The statistics with regard to disease given in the above mentioned reports of campaigns, vary greatly in fulness and form of combination. In the United States report of the war of 1861–65, the figures are given for the total admitted for each of 152 causes, for each month, for each color, for each of twenty-four localities or regions with the corresponding number of deaths and discharges.

In the report of the British Army in the Crimea the data are given for the total admitted for each of 101 causes, for each month, with the corresponding number of deaths. The total deaths are also given by age-periods, and for each arm of service by months, and the discharges are given by causes and arm of service.[1]

In the report of the German army in the campaign of 1870–71, the data are given for twenty-seven diseases or groups of diseases, for each month, for each arm of service, with the corresponding deaths.

In the report of the French army in the Crimea, the data are given by months for the total admitted and treated for each of seven forms of disease, with the corresponding number of deaths and transfers.

TABLE SHOWING SPECIAL DISEASES AND GROUPS OF DISEASES GIVEN IN MEDICAL REPORTS OF CAMPAIGNS.

	British in Crimea, 1854–57.	U. S. army, 1861–65.	German army, 1870–71.
General diseases			×
Infectious diseases		×	×
Smallpox	×	×	×
Diphtheritis		×	×
Typhus	×	×	×
Dysentery	×	×	×
Cholera morbus	×	×	×
Malarial fevers	×	×	×
Fevers	×	×	×
Rheumatic diseases	×	×	×
Acute rheumatism of joints	×	×	×
Consumption	×	×	
Scurvy	×	×	
Parasitic diseases		×	
Debility	×	×	×
Other general diseases			×
Diseases of the nervous system	×	×	×
Diseases of the respiratory system	×	×	×
Pneumonia	×	×	×
Pleuritis	×	×	×
Diseases of the circulatory system	×	×	×
Diseases of the digestive system	×	×	×
Diseases of the genito-urinary system	×	×	×
Venereal diseases	×	×	×
Diseases of the eyes	×	×	×
Diseases of the ears		×	×
Diseases of the integumentary system	×	×	×
Diseases of the locomotor sys em		×	×
Sore from walking or riding			×
Other unknown or undefined diseases			×

In statistics of disease and death an exceedingly important factor is age, and unless the data for certain individual causes are given by age-groups it is impossible to make such comparisons with the corresponding data relating to persons in civil life, or in other occupations, as are now required by scientific students of these subjects. We have no reason to hope that any substantial increase of our knowledge will come from mere gross sick-rates or death-rates, or from the proportion of deaths to cases for individual causes of disease. We have already a vast amount of statistics of this kind, which have been and will be useful, but it is improbable that more tables of this kind will open any new paths to knowledge. If, however, we can obtain data of this kind with age and race groupings, I think that they will indicate some new fields of investigation, and furnish valuable information.

[1] The report also gives for each arm of service the length of treatment of fatal cases for six selected causes and the deaths by rank.

TABLE SHOWING THE NUMBER OF SPECIAL DISEASES, WITH COMBINATIONS, GIVEN IN MEDICAL REPORTS OF CAMPAIGNS.

					British in Crimea.	U. S. army, 1861–65.	German army, 1870–71.
Number of causes					101	152	27
Admitted					0	0	0
×Causes					0	0	0
×Causes	×Arm of serv.						0
×Causes	×Color					0	
×Causes	×Localities					0	
×Causes	×Months				×	0	0
×Causes	×Rank						0
×Causes	×Arm of serv.	×Months					0
×Causes	×Arm of serv.	×Rank					0
×Causes	×Color	×Localities				0	
×Causes	×Color	×Months				0	
×Causes	×Localities	×Months				0	
×Causes	×Months	×Rank					0
×Causes	×Arm of serv.	×Months	×Rank				×
×Causes	×Color	×Localities	×Months			×	
Died					0	0	0
×Causes					0	0	0
×Causes	×Arm of serv.						×
×Causes	×Color					0	
×Causes	×Localities					0	
×Causes	×Months				×	0	×
×Causes	×Rank						×
×Causes	×Color	×Months				0	
×Causes	×Color	×Localities				0	
×Causes	×Localities	×Months				0	
×Causes	×Color	×Localities	×Months			×	
Discharged							
×Causes					0	0	
×Causes	×Color					×	
×Causes	×Arm of serv.				×		
Invalided					0		
×Causes					0		
×Causes	×Arm of serv.				×		

Another factor in medical statistics the effects of which it is desirable to study in connection with certain forms of disease, is race. In armies which contain both white and colored troops, such as the British in India and the United States army, it is usual to give separate tables for each, and the only special precaution required is to give separately the data relating to white officers serving with such troops.

With regard to white troops, the regimental and corps organizations in most armies are such that the different races are to a great extent classed by regiments, as for example the Irish and Scotch, the Saxon and Hanoverian, the Hungarian and Bohemian, etc. In the United States army, men of all nationalities are mingled in each regiment, and being thus exposed to the same conditions as to locality, food, climate, nature of service, etc., the race data may become especially valuable when collected for considerable periods of time—say ten years—as indicating for certain races a tendency to, or comparative immunity from, certain forms of disease.

Statistics of previous occupations are of much more importance when applied to the results obtained in those countries where military service is compulsory for a certain period of time than in those where it is not. For the latter, as in England and the United States, the

only value of such statistics in times of peace is in connection with the data relating to recruits, and is sociological rather than medical. Where military service is compulsory, if not on all adult males, at least on a certain proportion of them, the data of previous occupation, although still chiefly valuable when taken in connection with the data relating to recruits, have some value in connection with the data relating to certain forms of disease such as phthisis pulmonalis, rheumatism and gout, malignant tumors, and diseases of the circulatory system and locomotor apparatus. Such statistics are given only in the reports of the Bavarian army so far as I have seen, and in these reports the data of age are not given, so that it is not possible to compare them with corresponding data obtained from civil life.

For scientific purposes it appears to me desirable that the tables should deal chiefly with the total disposed of and not with the total number treated. For administrative purposes it is, as I have said, desirable to know the total loss of effective strength, which can only be done by taking into account those remaining under treatment at the end of the period for which the report is made, and in the study of causes of disease in relation to season, locality, etc., the number of admissions for each cause is the most useful factor, but the data to be used for advancing our knowledge of the effects of certain forms of sickness in their relation to locality, season, age, race, etc., should be derived solely from the completed cases. For such completed cases, then, I would suggest that the following combinations of data be given in the tables, viz.:

Table A., showing for the total number disposed of by certain causes and groups of causes, the number returned to duty, the number died, the number discharged, the number invalided otherwise disposed of, and the average duration of treatment, with ratios per thousand of mean strength for the total disposed of, and the ratio per thousand of all disposed of, for the deaths, discharges, and invalided. This table should be made out for the whole army for each year; it should also be made out for such subdivisions of locality as may seem desirable in each country for the total period under consideration; for the total troops in each arm of service, and for each of not less than five groups of ages. For each individual disease, and for each group of diseases adopted a table should be given, showing, with distinctions of five groups of ages and of under and over one year of service, the total number of cases disposed of and the number of deaths for each.

TABLE A.

Diseases and groups of diseases.	Disposed of.												Average duration of treatment.	Total disposed of per 1000 mean strength.
	Total disposed of		Returned to duty		Died.		Discharged.		Invalided.		Otherwise disposed of.			
	Off.	Men.	Off.	Men.	Off.	Men.	Off.	Men	Off.	Men.	Off.	Men.		
Smallpox.														
Enteric fever														
Etc.														
Etc.														
Totals														

This table to be prepared:

1. For the whole army. 2. For each arm of service. 3. For selected localities. 4. For color and nationalities.

TABLE B.

Diseases and groups of diseases	Total disposed of.																								Died.																							
	Ages.																				Length of serv ce.				Ages.																				Length of service			
	Under 20		20 to 25		25 to 35		35 to 45		Over 45																Under 20		20 to 25		25 to 35		35 to 45		Over 45															
	Off.	Men.	Off.	Men.	Off.	Men.	Off.	Men.	Off.	Men.	Under one year.	Over one year.													Off.	Men.	Off.	Men.	Off.	Men.	Off.	Men.	Off.	Men.															Under one year.	Over one year.		
Smallpox																																																
Enteric fever																																																
Etc.																																																
Etc.																																																
Totals																																																

This table to be prepared:

1. For the whole army. 2. For each arm of service. 3. For selected localities. 4. For color and nationalities.

TABLE C.

Arm of service.	Mean strength by ages.						Mean strength by months.												
	Under 20	20 to 25.	25 to 35.	35 to 45.	Over 45.	All ages.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November	December.	Total.
Infantry																			
Cavalry																			
Artillery																			
Etc.																			
Etc.																			
Total command																			

This table to be made for selected localities and for the whole army.

TABLE D.

Diseases and groups of diseases.	Total admitted.	Admissions by months.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October	November.	December.
Smallpox													
Enteric fever													
Etc.													
Etc.													
Totals													

We now come to the question of the mode of obtaining the data for such statistical reports as must be prepared at the central office of the medical department of an army, whether these are intended only for the information of the central office and for that of the War Department, or for publication. There are two essentially different ways of obtaining this information. The first is to throw a large part of the work of statistical compilation upon the medical officers of the several posts or commands, requiring them to transmit periodical forms monthly, quarterly, or annually, on which forms are given the medical statistics of their commands for the period in question in greater or less detail.

The other is to require the medical officers to furnish the complete data with regard to each case to the central office, where the work of compilation is chiefly done, leaving to the medical officer of the post or command the duty of preparing such statistics only as are required for the information of his commanding officer or of the commanding officer of the department. The conclusion which has been arrived at in the Surgeon-General's Office at Washington is, that the second method is preferable, and our present forms are, therefore, prepared upon this basis. They are large sheets on which are given the name, rank, company, regiment, age, race, birthplace, length of service, cause of admission, date of admission, complications and sequelæ, result and date of disposal (specimen submitted) of each person taken on sick report during the period for which each report is made, and the name and identification data for each name remaining on sick report at the beginning of the period, without attempting to sum these up in all the various combinations of which the data are susceptible—merely the gross morbidity and gross death-rate being stated. When these sheets are received at the central office, the individual data are copied off on cards which are then assorted in all the different combinations which are desired. I see no good reason why all this information should not be furnished by the medical officers of posts and commands upon cards—one for each individual case, when completed by return to duty, transfer, death, discharge, etc. At the end of the year cards should be forwarded for all cases then under treatment, and subsequent cards should be forwarded for these cases when completed. Cards of different colors, or printed with different colored inks, might be used for classification in various ways. The use of individual cards or slips is now recognized by all experienced in such work as the most convenient means of securing all the various combinations desired in vital and medical statistics, with the least amount of skilled labor. If desired, much of the sorting of the cards can be effected by mechanical devices, or they can be punched, and any combinations counted by means of the Hollerith electrical apparatus for that purpose. When not required for statistical uses, these cards can be filed in the alphabetical order of the names of the men to whom they relate, and in this way the medical and surgical history of each case in which there have been successive admissions on sick report will be brought together.

From much practical experience with this card system of records, I can confidently recommend it as the best method of securing and compiling medical and surgical statistics, and of preserving in convenient form the original data upon which such statistics must be based, and from which new combinations may hereafter be desirable. Herewith are presented the form of card used in the statistical division of the Surgeon-General's Office at Washington, and also the form upon which cases of injury or surgical operation are reported, together with forms of cards used in the Vital Statistics Division of the United States Census.

The great objection to relying exclusively on forms of reports compiled by individual medical officers, on which the detailed data for each individual are not given, is that they do not permit of numerous combinations which the statistician may desire to make when he has large numbers at his command, but which it is not worth while to provide space for in a form which is to be used for a single post or regiment.

For example, the form of monthly report of sick and wounded for administrative purposes proposed by Surgeon J. R. Smith, U. S. A., and approved by the Washington International Congress,[1] gives the data for individuals only for those dead or discharged, and it is, therefore, impossible to obtain from it with regard to those who do not die or are not discharged—*i. e.*, the great majority of cases—the data relating to age, race, duration of treatment, rank, etc., in their various combinations, with different forms of disease at different seasons of the year, which it may be desirable to compile for scientific purposes. It appears to me best to use forms of this kind for administrative purposes, and in addition to use the card system, combined with detailed reports of the more important cases, as the chief reliance for the collection of data to be compiled for scientific purposes.

We now come to the last subdivision of the problem under consideration, namely: Will it probably be possible to induce the different governments to agree to a uniform system of publication of the data and combinations of data which are required to increase our knowledge of the causes and results of disease and injuries? It appears to me that the answer should be "Yes." It is not likely that uniformity can be secured in the forms of returns of sickness and injury which are chiefly valuable for administrative purposes, since these must depend largely upon the organization and mode of administration of the individual armies, upon the duties of the chief medical officers of corps or departments, upon the amount of centralization in administration, etc., and it is not worth while to lose the substance by grasping too insistently at the shadow. But if the central office can obtain, by some such simple method as the card system above referred to, the statistical data for each completed case, and can at the same time obtain the data with regard to the whole body of men among whom the sickness and injuries have occurred—the mean strength data, in other words—for the purpose of computing ratios, it can then make careful studies of individual forms of disease or injury for long periods in all their various relations, and this without in any way interfering with administrative statistics, or being fettered by rigid forms adopted without sufficient prevision of the points which future discoveries may show to have been of scientific importance.

[1] See Transactions Ninth International Medical Congress Washington, D. C., 1887, vol. i. p. 71, and vol. ii. p. 29.

To sum up then, Army medical statistics of scientific value relate mainly to individual forms of disease and not to nosological groups, and are to be derived from individual records of completed cases; they should cover longer periods than one year to give valuable results in medical geography, and should be given with more details as to age, race, length of service, and average duration of cases than have heretofore been supplied in published statistics of this kind. Absolute uniformity is not to be expected nor is it desirable, but such statistics of different armies can be made comparable with each other and with the morbidity and mortality statistics of civil life to a much greater extent than has been done heretofore. The object of this paper is to establish a few general principles upon which we can agree and in accordance with which we may work in the future, rather than prescribe precise forms or to criticise the details of those heretofore employed.

ORIGINAL ARTICLES.

SOME NEW BACTERIAL POISONS; THEIR CAUSAL RELATION TO DISEASE AND THE CHANGES IN OUR THEORIES SUGGESTED BY THEIR ACTION.

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OF ANN ARBOR, MICHIGAN.

IN a paper[1] read in May, 1888, before the pædiatric section of the New York Academy of Medicine, I stated, as my belief, that the ordinary summer diarrhœa of infancy is not due to specific pathogenic microörganisms, but that it is due to putrefactive or saprophytic germs, which induce disease and death by the elaboration of chemical poisons in the intestines.

Able and skilful bacteriologists, among whom Booker in this country and Escherich in Germany deserve special mention, have made diligent search for the specific bacterium of summer diarrhœa, but no such organism has been found, and the probabilities are that it does not exist. The failure to find a specific germ has not arisen from the absence of bacterial species. On the contrary, the number of varieties and species has been confusingly great; but there is no constancy in the presence of any of them. In his first communication Booker reported the isolation of eighteen species, and he has subsequently added fifteen new ones to the list. Forms which appeared frequently one summer were wholly wanting the next. The large number and the great variety were not due to contamination, for the work was done with unusual care, the cultures being taken directly from the intestines of the sick child. Thus, it will be seen that in the case of this diarrhœa, which is so frequent during the hot eason, and which has been diligently studied by a number of the best bacteriologists, the very first of Koch's rules has not been substantiated. In view of these facts the following question quite naturally suggests itself: "Are there not two or more germs which are capable of inducing this disease?" With the hope of answering this question I asked Dr. Booker to send me some of his cultures. This he did last February, and with three of these species I did the following work. The germs used are the *X*, *a*, and *A*, of Booker.

Flasks of sterilized beef-broth were inoculated separately with these germs and kept in the incubator at 37° C. for ten days. At the expiration of this time the contents of the flasks were filtered twice through heavy Swedish filter-paper, and during the second filtration the filtrate was allowed to drop into a large volume of absolute alcohol, which had been feebly acidified with acetic acid. A voluminous flocculent precipitate resulted in the filtrate from each of the cultures. After subsidence of the precipitate the supernatant fluid was decanted and the precipitates from the cultures of *X* and *a* were dissolved in water and reprecipitated with absolute alcohol. The precipitate from *A* proved to be so sparingly soluble in water that, after thorough agitation with water, it was caused to subside by the addition of a large volume of absolute alcohol.

The precipitates were then collected and speedily transferred to a vacuum and allowed to dry over either sulphuric acid or caustic potash. They are proteid in character, yet differ in character from ordinary proteids and from one another. That from *a* forms on the porous plate a scaly, dark substance, which is easily soluble in water. From its aqueous solution it is not precipitated by heat or nitric acid, alone or combined. It is not precipitated by saturation with sodium sulphate or by a current of carbonic acid gas, and, therefore, cannot be a globulin. It is precipitated by saturation with ammonium sulphate, and, consequently, we cannot call it a peptone. It gives the xantho-proteid and biuret reactions, and on the application of heat gives off the odor of burning feathers. The proteid from *X* is lighter in color and less readily soluble than that from *a*, but in the other reactions the two agree. That from *A* is practically insoluble in water. The chemical properties of these substances will receive further attention.

All are highly poisonous. Small quantities injected under the skin of kittens and dogs cause retching, vomiting, purging, collapse, and death. Ten milligrammes of thedried proteid from *a* killed a large guinea-pig within twelve hours. A much smaller amount proved equally fatal, but the time required was much longer. When very small, but unweighed, quantities were used, many days (from ten to thirty) passed before death followed. A small percentage of the animals experimented upon with

[1] THE MEDICAL NEWS, June 9, 1888.

the very small doses have remained permanently unaffected.

The post-mortem appearances in all the cases have been practically the same. The small intestines are pale throughout and tightly constricted in places. The heart is in diastole. Marked changes in other organs have not been observed.

These experiments show that three germs, which differ morphologically from one another sufficiently to be classified as different species, form poisons which also differ in their chemical properties, but which produce the same symptoms and post-mortem appearances. It must be remembered that no one of these germs is constantly present in summer diarrhœa. Sometimes *X* is found almost in pure culture, while in other cases this is absent and *a* or *A* abounds, and in a still greater number of cases no one of these three can be found and we have in their stead another or others of Booker's long list. These three were taken at random from the number which Dr. Booker has isolated, and it is probable that many more are equally powerful.

While *X*, *a*, and *A* differ morphologically, physiologically they are near akin. All are capable of producing powerful poisons. I propose that such germs be called *toxicogenic*. Not only do *X*, *a*, and *A* resemble one another in producing poison, but their poisons cause similar effects.

Germs, in their causal relation to disease, cannot be classified simply from their morphology; we must also understand their physiology; we must know something of the chemical changes which they cause by their growth.

Bacteria are divided into the parasitic and the saprophytic. The obligate parasite can live only on living matter; the obligate saprophyte can feed only on dead matter. The bacilli of leprosy and of syphilis are probably obligate parasites. They have not been grown on artificial media. True parasitic germs do not prove speedily fatal to their hosts. Their own continued existence depends upon the continued existence of their host, or on their transference to another host. Bacteriologists have taught that the true parasitic germs are the most deadly. This cannot be true. On the other hand, it is for the well-being of the saprophytic germ to destroy life, for in so doing such a germ furnishes itself with more nutriment and improves the conditions of its own existence. But, it will be asked, How can a saprophytic germ live in the human body and how can it prove fatal? The bacterium growing in the intestines of man does not necessarily feed upon living matter. The food before absorption is not endowed with vitality. Saprophytic germs will grow in the peptone preparations in the test-tube; why should they not feed upon peptones in the small intestines? The excretions passed into the intestines are not living, and upon these also, saprophytic germs may feed. Growing in the intestines saprophytic germs induce disease and death by producing chemical poisons which are absorbed.

These facts, if they be true (and their truth seems to me to be demonstrated by the facts shown above, that three different saprophytic germs produce poisons capable of causing the symptoms of summer diarrhœa, and death), materially alter the teachings of the bacteriologist. The tendency of such teachings has been for the past few years toward the belief that filth in and of itself cannot cause disease. That filth must be infected with some parasitic or specific germ in order to cause disease, is a doctrine which has met with acceptance. If my deductions from the above experiments be true, there is no specific germ in summer diarrhœa. All toxicogenic germs are dangerous when introduced into the intestines. They will there find an abundance of dead matter to feed upon. Not only is this true, but they will find that kind of dead matter which is best suited for their growth. It is generally conceded that saprophytic germs can only feed upon, or at least thrive best only in the presence of, diffusible proteid material. For this reason peptone is an important constituent of the nutritive gelatin which we use in our culture-tubes. In the intestines these diffusible proteids abound. Many of the saprophytic toxicogenic germs are anaërobic, and in this respect also, the conditions prevailing in the intestines favor their growth.

Again, if these deductions be correct, we have, in the question of the prevention of the intestinal diseases of childhood, quite a different problem from that presented by those who believe in a specific germ. We have to guard against the introduction into the child's stomach not of a single germ which abounds in certain localities, but we must protect the child from a whole host of toxicogenic germs which are widely and abundantly distributed. Milk infected with any one of a dozen different organisms may cause disease and death.

But, says one, if this be true, if there are so many possible causes of these diseases, how is it that so many children manage to live? The mortality must be admitted to be great, when we remember that more than one-fourth of the children born in the United States die before they reach five years of age. However, nature has not placed about infancy so many dangers without making some provisions to protect the child. In the first place, as has been shown by numerous experiments, the infant taking its food directly from the clean breast of the healthy mother gets its food wholly free from germs of all kinds. Moreover, both in infancy and in adult life at least one of the digestive secretions,

the gastric juice, is a powerful germicide, especially destructive to those organisms which infect by the way of the intestines. So far as experiments have been made, there is no germ which is known to have a causal relation to an intestinal infectious disease and which is not destroyed by the action of a healthy gastric juice, when exposed to such action for only a few minutes, or for half an hour at most. As Escherich has shown, one of the great dangers in artificial feeding lies in the greater power of cow's milk to neutralize the acid of the gastric juice. Overfeeding is also an important factor in the production of the intestinal diseases of infancy. I believe with Bunge[1] that the chief office of the acid of the gastric juice is to protect us against infection through the intestines. Certainly every step in the process of digestion could be carried on without the presence of acid in the stomach. Even the digestion of proteids proceeds much more rapidly in the alkaline secretion of the pancreas than in the acid one of the stomach.

Again, we are probably to a large extent protected from the injurious effects of these poisons formed by the saprophytic germs in the intestines by the absorbing mechanism of the intestinal walls. We know that in health we are thus protected from the injurious effects of certain products of normal digestion. The proteids of our foods are converted into peptones, but there are no peptones in the blood, even in the portal blood. If peptones are injected into the blood they are poisonous. In health they are changed into serum-albumin and globulin while they are being absorbed. Now, these new bacterial poisons are proteid in character, as has been shown, and when formed in the intestines the only way in which we can be saved from their deleterious effects is by the action of the absorbing mechanism of the intestines upon them, converting them into harmless proteids. Right here lies the explanation of the greater susceptibility of the infant to these poisons formed by the saprophytic germs in the intestines. The rapid absorption from the intestines of the infant renders the passage of these poisons into the blood unchanged more easy and certain. In this is also to be found the explanation of the favoring influence of constitutional disease, and of prostration from heat, on the frequency and fatality of summer diarrhœa. Anything which lowers the general vitality of the child diminishes the normal resistance of the living cells to the proteid poison.

To conclude this part of the discussion, we may say that any germ which is capable of producing a poison in a flask containing a proteid material is not a safe one to introduce into the intestines. It is not necessary, in order to show the dangerous character of a germ, to prove its pathogenic property by inoculating an animal through the blood. In the blood the bacterium meets with very different conditions from those existing in the intestines.

The same general statements which I have made concerning the summer diarrhœa of infancy will, I believe, hold good in the case of enteric fever. I have recently reported the isolation of proteid poisons from cultures of two germs found in drinking-water supposed to have caused typhoid fever.[1] But, says one, the specific germ of typhoid fever has been found, and is the well-known Eberth bacillus. It is true that this organism is found in the spleen practically in every case of death from typhoid fever, and this is the sole evidence that we have of its relation to the disease. Continued fever with ulceration of the small intestines can be induced in the lower animals by a number of saprophytic germs. The great diversity in the symptoms and course of the continued fever in different sections of the country, and in the same locality at different times, seems to me quite an argument against the specific character of the disease. There is now fair promise of a satisfactory explanation of the true relations between the Eberth bacillus and typhoid fever. The bacterium coli commune is an organism which is constantly present in the healthy large intestine. In certain diseased conditions it finds its way into the internal organs. Typhoid fever is one of these diseases, and Rodet and Roux[2] conclude from their studies that Eberth's bacillus is only a degenerative form of the bacterium coli commune. Just what *rôle* this germ, by altering its place of residence, plays in the causation of the disease we do not know. But practically this observation is of great importance, because, if it be true, filth, in and of itself, may cause typhoid fever.

The fact that these new bacterial poisons may cause death, when injected under the skin in small amounts, after from ten to thirty days, is of great interest. We cannot believe that chemical poisons increase in amount in the body. They probably have a catalytic action, setting up a series of changes from which death results. The great majority of catalytic changes consist in the splitting up of complex molecules into simpler ones. Such a conversion is accompanied by the liberation of heat. In this we may have an explanation of the causation of fever in the infectious diseases. Some of the proteid of bacillus *a* was injected under the skin on the backs of two dogs. Retching, vomiting, and purging began within half an hour and continued for two days, after which the dogs slowly recovered. During these two days the dogs were much exhausted, and lay for the greater part of the time with their heads on

[1] Physiologische Chemie.

[1] THE MEDICAL NEWS, June 14, 1890.

[2] Comptes Rendus, February 21, 1890.

the floor, and shivering; but the rectal temperature during this time varied from 102.5° to 103.5°.

The following experiment was made with great care, but must be repeated before any positive conclusions can be drawn:

Two guinea-pigs were treated with hypodermic injections of one of these poisons. Within twelve hours both were dead. Plate-cultures made from the liver, spleen, blood, brain, and spinal cord remained sterile. Small quantities of the brain and spinal cord were rubbed up in a sterilized Petri dish with sterilized water, and a Pravaz syringeful of this emulsion was injected under the skin of each of four guinea-pigs. These animals seemed to be very excitable the next day, throwing themselves about violently in the cages when slight noises were made about them. Three out of the four have died, the first after sixteen, the second after eighteen, and the third after twenty days. This would indicate to me that the poison accumulates in the brain and spinal cord. However, similar experiments must be made with the blood and with emulsions similarly prepared from other organs of the body.

The following question has arisen in my mind: If these small cellular organisms, the bacteria, are capable of converting the ordinary proteids into such powerful poisons, why is it not reasonable to suppose that the glandular cells of our own bodies may under abnormal nervous stimulation or excitement also convert the ordinary proteids into similar poisons? Is the story of the nursing mother's milk becoming poisonous to the infant after great fright altogether unreasonable and wholly unexplainable? May not the hunted dog, when pursued and stoned, become rabid on account of the improper action of the cells of the salivary glands? These and other questions of a similar character quite naturally present themselves, and I have no doubt that in time a satisfactory answer will be found for them.

The discovery of these new bacterial poisons promises materially to alter our views of the nature of disease in many important respects.

Some four years ago Mitchell and Reichert[1] announced the discovery of poisonous proteids, a globulin and a peptone, in the venom of serpents. At that time their work was criticised, notably in Germany, on the ground that poisonous proteids were not believed to exist, but there can no longer be any such doubt. In 1888 Christmas[2] obtained from cultures of the staphylococcus aureus a proteid which, when injected into the anterior chamber of the eye or under the skin, caused suppuration. Haskins[3] has isolated from cultures of the bacillus anthracis a poisonous albumose. Very recently Brieger and Fränkel[1] have obtained from cultures of Löffler's bacillus of diphtheria a poisonous albumin which induces the paralysis and other symptoms of the disease, and which, when used in small quantity, produces death, sometimes after a period of twenty or thirty days. The same investigators have shown that similar bodies are produced by the germs of cholera and tetanus, and by Eberth's germ. Baginsky and Stadthagen[2] have found a poisonous proteid in growths of the summer diarrhœa bacterium, discovered by the former. These numerous investigations leave no room for doubt as to the existence and importance of these bodies. I have no doubt that they will prove to be the active agents in some cases of milk- and cheese-poisoning. Indeed, in the article which I read two years ago, referred to in the beginning of this paper, I predicted the discovery of new chemical poisons which would prove to be the active agents in the causation of the catarrhal diarrhœas of infancy. The new poisons which I have isolated from growths of the germs of Booker make good this prediction.

This paper would be incomplete if we did not look at another side of the question. While the harmful proteids play such an important part in the causation of disease, there are other proteids which serve to protect us against disease. The germicidal properties of the blood have recently attracted much attention. These properties have been shown to reside, not in the white corpuscles or other formed elements, but to be due to the presence and activity of certain proteids. This has been satisfactorily demonstrated by Büchner, Sittmann, and Orthenberger;[3] also by Fodor.[4]

Thus, it will be seen that the study of the proteids of the body and of those altered by bacterial growths promises to throw much light upon the causation, prevention, treatment, and nature of disease.

We may formulate the conclusions which are apparently justified by the present state of our knowledge, in the following propositions:

1. Man is attacked by the infectious diseases either through the alimentary canal or through the blood (or lymph).

2. The gastric juice is a physiological guard against infection by the way of the intestines.

3. Additional guards against infection by the intestines are probably to be found in the absorbing cells of the stomach and intestines.

4. Susceptibility to the intestinal infectious diseases is increased when for any cause these physiological guards are defective.

[1] Researches upon the Venom of Serpents, 1886.
[2] Annales de l'Institut Pasteur, 1888.
[3] British Medical Journal, 1889.

[1] Berliner klinische Wochenschrift, Nos. 11 and 12, 1890.
[2] Ibid., No. 13, 1890.
[3] Archiv für Hygiene, B. 10, H. ii., 1890.
[4] Centralblatt f. Bacteriologie u. Parasitenkunde, B. 8, No. 24, 1890.

5. All toxicogenic germs are dangerous when introduced into the intestines, and their capability of doing injury lies in their production of chemical poisons.

6. Many of these poisons are proteid in character.

7. These poisonous proteids most probably act by catalysis.

8. In the splitting up of complex molecules into simpler ones heat is liberated and fever manifests itself.

9. The physiological guard against infection through the blood or lymph lies in the germicidal action of the proteids of these fluids.

10. Susceptibility to infection through the blood or lymph is increased by impoverishment of these fluids.

11. We can continue to treat consumption and other systemic diseases by the employment of liberal diet, exercise in the open air, and constitutional remedies without being unscientific in our practice.

12. Filth, without being the bearer of a specific germ, is a cause of disease.

13. Wherever man pollutes the soil about him, the air which he breathes, and the water which he drinks, with his own excretions, there enteric fever will be found.

14. In their causal relation to disease, germs cannot be classified without a knowledge of the chemical changes which they induce.

15. While certain bacterial poisons can result only from the growth of certain germs, other poisons similar to one another in their action, though probably not identical, may result from any one of a number of organisms. In the former case we have such diseases as anthrax and smallpox, with their practically constant symptoms and well-marked course; in the latter case we have such diseases as the summer diarrhœa of infancy and enteric fever, with their varying symptoms.

PERMANENTLY GOOD RESULTS OF EXCISION OF THE MEMBRANA TYMPANI AND MALLEUS IN A CASE OF CHRONIC AURAL VERTIGO; ALSO IN A CASE OF CHRONIC SUPPURATION OF THE TYMPANIC ATTIC.[1]

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As two years and more have elapsed since the first of the two cases I narrate was operated upon and a year in the second case, I have considered the results as worthy the attention of this Society; because, no matter how good the immediate result of any operation may be, a just estimation of the operation and its results can be formed only after the lapse of considerable time.

The case of chronic aural vertigo was operated upon in May, 1888, and a report of the case and the operation was read at the meeting of this Society, in July, 1888. Briefly recapitulated, the case was as follows:

Miss D., aged thirty-one, was first seen by me in November, 1881, the case being diagnosed as one of chronic catarrh of the left middle ear, attended with annoying tinnitus and with hearing of only six inches for isolated words. All known methods of treatment for such cases failed to relieve the deafness and tinnitus.

There was no aural vertigo at that time. I lost sight of the case for six years, when I received a letter from the patient stating that she was suffering greatly from tinnitus in the left ear and frequent attacks of severe vertigo, which at times obliged her to cling to a lamp-post or a similar object when she was attacked by vertigo in the street. Upon inspection of the ear in May, 1888, it was found that the malleus was adherent to the promontory, and the constant retraction of the chain of ossicles thus produced was deemed the cause of the tinnitus and vertigo.

The patient was etherized and the membrana tympani and malleus excised. The tinnitus and vertigo immediately ceased and have never returned. A new membrana tympani formed in this case in the course of two months and has persisted to the present time. The hearing has remained unchanged.

A letter from the patient a few weeks ago informs me that her health and strength, previously impaired, are now excellent, that the ear remains free from subjective noise, and that the vertigo has never returned. More than two years have elapsed since the operation which gave the relief. As far as I can discover, this is the first case of chronic aural vertigo (so-called Ménière's symptoms) reported as cured by an operation such as I have described. The case furthermore proves the mechanical origin, and not a neuropathic one, of many cases of so-called Ménière's disease, a point I have long contended for.

The second case was a typical one of that inveterate class, known as "attic disease," in which a chronic suppuration in the tympanic attic has its only outlet through the membrana flaccida, and in my experience always bids defiance to all modes of treatment heretofore proposed for its cure.

This case came under my observation two years ago, and gave the following outline of history:

The patient, a lady of twenty-three, stated that she had had some catarrhal symptoms in her nose, throat, and ears in childhood, and that the tonsils were deemed worthy of excision, and this was followed by earache and dulness of hearing in both ears. These symptoms soon wore off and were

[1] Read at the annual meeting of the American Otological Society, Hotel Kaaterskill, July 15, 1890.

forgotten, excepting that the right ear, the one now suppurating, never heard well after the excision of the tonsils.

In 1882, six years before first consulting me, suddenly, and without previous warning of any kind, the right ear felt *stopped*. She says that examination by her physician at that time revealed a polypus in the right ear. The polyp was removed, and since then there has been a slight, nearly constant, offensive discharge from this ear, but hardly enough to flow from the meatus. In the meantime numerous polypi have been removed from this ear, probably from the region of the perforation in the membrana flaccida, by surgeons in this country and in Europe, but no permanent relief has followed these operations. This want of success was due to the fact that the treatment had been one of symptoms and not of the disease itself, which in reality was a necrosis of the head of the malleus, as shown by the operation I performed.

At the time I first examined the case the hearing in the affected ear was *nothing*. The membrana vibrans was found intact and dry, retracted, white, and shining; in the membrana flaccida there was a large perforation, through which the white neck of the malleus could be seen, and from which a scanty, sticky, offensive discharge came, clinging mostly to the upper wall of the external auditory canal. I, too, then proceeded to treat symptoms, as my predecessors in the case had done, and for one year I applied all known rational means of treatment to the case, by antiseptic injections into the attic cavity with the tympanic syringe, and by snaring off small polypi from time to time as they appeared around the perforation; but all without any good result, simply because I had not reached and could not get at the true disease in the attic, so long as the membrana tympani and the malleus barred the way.

Therefore, on July 29, 1889, the patient was etherized, and under illumination of the auditory canal by means of the electric head-lamp, as devised for Dr. Sexton by the River and Rail Electric Light Company of New York, the membrana tympani and the malleus were excised. The head of the malleus was found half destroyed by necrosis in its free anterior portion, its articular surface with the incus being normal. The other ossicles were not seen, but as far as could be decided by the probe, there were no necrotic spots anywhere else within the tympanic cavity—an opinion which was strengthened by the speedy healing of the diseased region after the operation.

Here, then, was the cause of the previously incurable purulent discharge from the attic space. The ligaments about the neck of the malleus were very tough and broad, and had acted as a diaphragm between the attic and the atrium, and also as the floor of a sinus running from the diseased malleus to the perforation in the membrana flaccida.

The steps of the operation of excision consisted in:

1. An incision behind the short process, with a slender blade.

2. Through this initial incision a round-pointed blade, curved in the plane of its broad surface, was introduced, and being kept close to the manubrium, below the insertion of the tendon of the tensor tympani, was pressed upward against the latter, and the tendon thus severed.

3. Then a straight blade, with rounded blunt end, was used to cut around the membrana tympani in the annulus tympanicus, thus entirely detaching it, and severing the hammer ligaments at the neck of the bone.

4. Instead of forceps the polypus snare was now used to seize the malleus, being passed around the manubrium, and the malleus with the membrana tympani was removed from the ear.

The slight hæmorrhage was controlled by mopping the fundus of the ear with a 4-per-cent. solution of cocaine muriate. During the operation the fundus of the ear was mopped frequently with a 2½-per-cent. solution of carbolic acid. After the operation the meatus of the canal was lightly tamponed with cotton sprinkled with iodoform, and left in place for twenty-four hours.

The next day the patient went about the house. The cotton tampon was slightly discolored on its inner end with a pinkish serum. There was no purulent discharge and there has not been any since the operation, nearly twelve months ago.

The iodoform tampon in the auditory canal was discontinued in four or five days, and one containing powdered boric acid sprinkled over it was substituted and worn for a week longer. Then simply a little cotton pellet was worn in the meatus, in the open air, to protect the exposed tympanic cavity. On some days the tampon was a little moistened with a serous fluid, but this soon ceased to appear. The absence of any reaction and the tendency to rapid healing in this case I am disposed to attribute largely to the antiseptic measures during and after the operation.

By August 12th there was no discharge of any kind from the ear. The hearing was found to be a little improved; about a foot for loud words.

Aug. 19. Still no discharge. The mucous membrane of the promontory is pale and rough, but entirely dry. The region of the membrana flaccida is narrowing. Hearing equals a whisper at six inches.

The patient now went on a tour to the Adirondacks, *free, for the first time in seven years, from the annoyance of a running from the ear and the care it demanded.*

The patient was not seen again until September 25th, when it was found that a new membrane had formed from the segment of Rivinus, the region of the membrana flaccida, down to the promontory. There was no discharge. The hearing for whispered words, was two to three feet.

October 11. The delicate membrane, bluish and transparent, rises and falls under gentle suction with the pneumatic speculum. The hearing is *nine feet* for isolated words in ordinary conversational tone.

At the present time the hearing is fifteen feet for whispered words.

Here, therefore, is offered an account of a case of chronic purulency and deafness, caused by necrosis of the head of the malleus and altered tension and conductivity in the ossicles, cured of the discharge and the deafness by excision of the useless membrane and a necrotic malleus. The cure of the purulency is easily explained, but the improved hearing is not as easily explicable. I venture to suggest that the conducting power of the ossicles was interfered with by the presence of pus about the ossicles in the attic, and by the pathological bands about the malleus already mentioned, which prevented ready vibration. Also the diseased condition of the head of the malleus loosened its articulation with the incus, and impaired its leverage on the latter. Hence, a wave of sound falling on the membrana and malleus could not transmit its inward oscillations to the incus and thence to the stapes and the labyrinth.

When the membrana tympani and the necrotic malleus-head were removed from the attic, waves of sound fell directly upon the incus and the stapes and were conveyed to the labyrinth. As the new membrane formed and rested against the ossicles remaining, its expansion offered a broader surface to the waves of sound, and possibly helped to increase their leverage on the remaining ossicles, thus transmitting more sound and increasing the hearing. The continuance of this normal stimulus to the movements of the stapes in the oval window gradually overcame the partial ankylosis which had ensued at that point, from disuse, and the hearing, in consequence, has *steadily improved* since the operation from nothing to *fifteen feet* for whispered words.

Let us suppose that the chronic purulency of the attic had been, or could have been, cured by injections through the perforation in the membrana flaccida into the attic cavity. The hearing would not have been improved, because the impaired malleus-head and the pathological bands around the neck of the malleus would not have been removed, and hence the impaired mobility of the incus and stapes would still have remained as a hindrance to hearing.

We see, therefore, that the operation of excision of the membrana tympani and the malleus offers not only a great means of curing chronic purulency, especially of the attic, but also of relieving deafness due to a stiffened membrana and ossicles, by the removal of pathological bands prohibiting free oscillations in the ossicles, and by thus permitting sound-waves to fall directly upon the stapes in the oval window.

Longevity in Norway.—A recently published government report from Norway shows an increased average longevity for that country. The average duration of life there for males is 48.3 years, and for females 51.3 years.

FISTULOUS ESCAPE OF LIGATURES AFTER PELVIC OPERATIONS.[1]

BY MARIE B. WERNER, M.D.,
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As the science of abdominal surgery advances, we feel that it is not a report of successful operations alone, but the number of absolute cures, which establishes a reputation and makes the successful surgeon. Since the days when Lister first laid down the rule for antisepsis, which in turn gave birth to the crowning aid to surgery, thorough asepsis, the rate of mortality has diminished remarkably. The number of abdominal seetions for various lesions increased, and with the number of recoveries the dread of such surgery diminished. Those earnestly engaged in effecting lasting cures soon began to see that it was not always recovery from an operation which meant a cure. The patient was not yet always safely landed; fistulæ, secondary adhesions, painful stumps, or unfinished operations, marked the shoals upon which the hopes for a perfect cure might be wrecked. It becomes our duty to study, like the successful navigator, these shoals in detail, and, if possible, to place the danger signal conspicuously in our minds, in order to be able to avoid a second exposure to similar dangers.

The reports of the most successful operations prove that rapid aseptic work, with as few instruments and sponges as possible, a clean stump, light ligatures applied closely to the uterus and with the ends cut short, and thorough irrigation prevent many of the complications. If there is much oozing from torn adhesions, or if pus is present, the drainage-tube becomes a valuable aid, provided it is properly cared for, cleaned at intervals of twenty or thirty minutes with a syringe, and removed as soon as the effusion becomes serous and less than a drachm at each removal.

Last but not least, comes the importance of including muscle and fascia in closing the abdomen. The fact that various gynecological societies have taken up the discussion of the behavior of ligatures after the removal of diseased uterine appendages induces me to record the following cases. The first was my own operation; the second case placed herself under my care three months after operation.

Knowing full well that there must always be a cause for unexpected happenings, I was anxious to satisfy myself of the cause in these cases, and I think that I succeeded.

CASE I.—Operation in March, 1887. Right ovarian cyst; cyst-walls friable, and adhesions present. The ligature was of Chinese twisted silk and of

[1] Read before the American Medical Association, May, 1890.

Operator.	Operation.	Ligature.	Drainage.	Remarks.	History of Fistulæ.
Dr. W. H. Parrish, 2 cases, personal communication.	Double ovariotomy.	Black silk figure-of-8, one side; shoemaker's knot on the other.	No.	Both ovaries cancerous, one presenting a large tumor of about twenty pounds, the other the size of a large orange. General condition poor.	Fistula: two months later shoemaker's ligature discharged and fistula closed spontaneously.
	Removal of appendages on both sides.	"Rather large Chinese ligature," figure-of-8.	Yes.	Syphilitic negress; confirmed drunkard; unruly, and walked across the ward on second day, the glass tube *in situ*. Fistulous opening in lower angle of wound.	Nine months after operation removed one ligature with hooked end of small probe. Subsequently a counter opening was made, per vaginam, by another gentleman; no avail. Later, laparotomy by a third resulted in death.
Dr. Charles M. Wilson, personal communication.	Ruptured ectopic gestation of six months.	Staffordshire knot.	.....	.....	Six months later one of the ligatures ulcerated its way out through the abdominal cicatrix.
Dr. H. M. Weeks, personal communication.	Ectopic gestation, November, 1888.	Twisted silk No. 3, figure-of-8.	Prolonged drainage; tube cleaned by irrigation and the long syringe with distilled water.	.....	Ligature came away five months after the operation.
Dr. H. T. Hanks, reported to the N. Y. Obstet. Soc., Jan. 7, 1890.	Ruptured ectopic gestation.	.....	Yes; irrigation twice daily.	"The right broad ligament through which the hæmatocele had ruptured was very friable, and the suture had a strong tendency to cut through."	Ten days after operation two ligatures were removed from the sinus. Patient made a good recovery.
Dr. Ashton, Annals of Gynecology, April, 1890.	Jan. 1888, abscess of right ovary and tube.	.....	Yes.	Track of drainage-tube did not close. October, 1888, second section resulted in finding one ligature after flushing out the abdomen; no drainage, yet a fistula resulted, necessitating a third operation in February, 1889, with complete closure. The following August, however, the fistula reopened and discharged a ligature.	
Dr. B. F. Baer, personal communication.	Ovariotomy.	Chinese twisted figure of-8.	Yes, for two days; tube cleaned with syringe every half hour.	There were intra-ligamentary adhesions to descending colon and small intestine; fæcal fistula resulted.	Fæcal fistula caused by thinning of bowel and the drainage-tube. Ligature came away two weeks after operation.
Dr. J. M. Baldy, personal communication.	Ectopic gestation; local peritonitis.	Twisted silk, figure-of-8.	Yes, 8 to 12 days; tube cleaned with syringe every hour.	Intestinal adhesions, beginning gangrene of sac, fistula at site of drainage-tube, refused to heal by usual methods.	Ligature came away thirteen weeks after operation; fistula healed spontaneously.
Dr. H. Beates, Jr., 4 cases, personal communication.	Salpingitis.	Twisted silk No. 3, Staffordshire.	Yes, 1 to 2 days; injections of bichloride (1 : 10,000) cotton capillary dressing.	General adhesions.	Fistula at site of drainage-tube. Ligature came away in twelve weeks; healed.
Dr. Beates has had three cases of fistulæ from other operators, in which "fishing out" resulted in a cure. Ligatures, twisted No. 4 in one, smaller in two.	Pyosalpinx.	Same.	Same as above.	General adhesions; patient in bed five weeks.	Fistula. Ligature came away in eleven weeks; healed.
	Pyosalpinx.	Same as above.	Same as above.	General adhesions; patient in bed five weeks.	Ligature came away in fourteen months.
	Ovariotomy; multilocular cyst.	Same as above.	Same as above.	No complications.	Ligature expelled through abdominal fistula in ten weeks.
Dr. Hannah T. Croasdale, personal communication.	Removal of tube and ovary of one side; local peritonitis.	Cable twist No. 3, Staffordshire knot.	8 hours.	Extensive adhesions prevented removal of appendages of other side.	Patient in bed from June 2d to February 9th. Ligature discharged January 31st; rapid improvement afterward; the wound entirely healed February 4th.
Dr. Joseph Hoffman, 2 cases. personal communication.	Pyosalpinx.	Chinese twisted No. 3, figure-of-8.	Yes; tube cleaned with syringe at short intervals.	General intestinal adhesions; local peritonitis.	Ligature discharged in about three months. Patient remained in bed six weeks.
One case from his practice, the other under observation.	Pyosalpinx.	Same.	Yes.	General intestinal adhesions; general peritonitis; pus.	Ligature discharged in about three months. Patient in bed two months
Dr. H. A. Kelly, reported in the British Gynecological Society, by F. B. Jessett, October 23, 1889.	Left ovarian dermoid cyst.	Chinese silk.	.....	Dr. Kelly reports that "in her convalescence she had a large ante-uterine hæmatocele which is slowly undergoing contraction."	Mr. F. B. Jessett finds, five months after operation, an abscess in the anterior wall of the vagina; opens, drains, and finds a Chinese silk double ligature. Negative history regarding rigors and high temperature.

Operator.	Operation.	Ligature.	Drainage.	Remarks.	History of Fistulæ.
Dr. D. Longaker, personal communication.	Hydrosalpinx, puerperal; local peritonitis.	Plaited silk medium size, figure-of-8,	Yes; 36 hours	Extensive adhesions; sinus following drainage track.	After a few months one ligature was thrown off; at the end of the sixth month the second came away. Fistula failed to heal for one year; was finally curetted and injected with nitrate of silver and healed.
Dr. Charles B. Penrose, personal communication.	.....	Twisted silk No. 3, figure-of-8.	.....	.....	Has had two cases in which a sinus lasted several months: one due to syphilis, the other to tuberculosis. Never had a case of discharged ligatures in abdominal section.
Dr. Wm. Goodell, reports in the Phila. Obst. Soc., March 7, 1889, the following 3 cases.	Removal of intra-ligamentary cyst.	.....	.....	Compelled to re-open wound for bleeding; five days after a fistula resulted.	One and a half years after operation fistula still remains; the only annoyance to the patient is an escape of gas.
	Pelvic abscess.	.....	Prolonged.	A counter-opening may yet be necessary per vaginam.	Fistula caused by the prolonged use of the drainage-tube.
	Recurrent intra-ligmentary cyst lying in a large abscess cavity.	.....	Yes.	Fistula resulted from a previous operation in which a clamp had been used many years ago.	Fistula still present at the time of the report; was then trying to heal with iodine applications along the entire track.
Dr. B. C. Hirst, 2 cases, personal communication.	Pyosalpinx.	Twisted silk, figure-of-8.	No.	Patient was easily managed; out of bed three weeks. Excessive hæmorrhage necessitated passing two strong ligatures at the base of the right broad ligament	Fistula of a year's standing. After discharge of ligatures, fistula healed.
	Removal of former stump one-quarter ovary, and four ligatures.	.....	.....	The ligatures were not surrounded by lymph; accessible to sight and touch. Pain, which had followed previous operation, disappeared after their removal.	
Dr. John B. Deaver, 2 cases, personal communication.	Double pyosalpinx.	Twisted silk, figure-of-8.	Yes.	Many adhesions.	Fistula at site of tube track. Ligature was expelled four weeks after operation.
	Ovariotomy for large multilocular purulent cyst.	.....	Yes.	Patient had been tapped a number of times, making dense adhesions.	Fistula in tube track. Ligature was expelled six weeks after operation.

medium size. A Staffordshire knot was used. Drainage for five days; recovery good. With the exception of an occasional pain in the region of the stump the patient was well and attended to her household duties. Fifteen months later, however, the patient brought the ligature, claiming to have discharged it from the urethra after much tenesmus at micturition. She gave a history of much previous pain over the right side of the bladder and frequent desire to urinate. Examination showed slight tenderness of stump and a tendinous cord leading to bladder. After a few weeks all tenderness disappeared and the patient was well.

CASE II.—Operation in May, 1887, by Dr. R. S. Hunt. I was present at the operation. There was a cyst of the left broad ligament. The ligature was braided silk, No. 9, tied in a Staffordshire knot; no drainage. Aside from several stitch abscesses recovery was good, and patient was up in four weeks.

During the latter part of August of the same year the patient experienced great pain in the scar, shooting toward the right side. A small abscess formed in the scar, was lanced, washed, probed, and found to extend down toward the stump. In about two weeks the ligature was expelled, and in a short time all had healed.

The first case presents two factors, each of which may account for the discharge of the ligature. First, the friable condition of the cyst-wall, part of which helped to form the stump, the surrounding tissues from want of vitality failing to encapsulate or absorb the ligature. Second, the length of time the drainage-tube was left *in situ*, owing to my inexperience, this being my first case in which drainage was used. I left it in long enough to become an irritant, and had some difficulty in healing the track.

The trouble in the second case was undoubtedly due to the size of the ligature; the tumor being small and the pedicle in consequence short, the ligature slipped over the button the moment shrinkage of the stump took place.

In connection with this subject I have endeavored to collect as many cases as possible, with a brief history of each. It is only by concentrating our forces that we are able to win the battle, hence the study of cause and effect becomes most necessary.

Dr. Thomas Keith, in his little book entitled *Contributions to the Surgical Treatment of Tumors of the*

Abdomen, relates his experience with catgut ligatures. He says:[1]

"Twice I have had hæmorrhage happen in ovariotomy, and on both occasions catgut ligatures were used; in one some thick catgut ligatures had been used on very thick omentum. Several of the knots came away through the wound, and after weeks of horrible suffering from cystitis, a thick knot of catgut, with the loop but little absorbed, was passed by the urethra."

Dr. Matthew D. Mann tells us in his report of 160 abdominal sections[2] that fistulæ are due either to an abscess in the pelvis from some foreign substance, or the use of the drainage-tube, and he cites an experience in which a fistula resisted all attempts at healing for four years. He is confident that this case was due to a silk ligature. This induced him to use catgut, which proved more satisfactory. Indeed, he feels so sure of its harmlessness that he was comparatively at ease when he found a fistula and discharge of pus follow the use of the drainage-tube, knowing that there was no infected silk at the bottom of the sinus. Later, two knots of catgut came out of the sinus, after which it readily closed.

In a communication from Dr. H. A. Kelly he writes the following:

"I have had a number of cases in which the ligatures have all been cast off through the abdominal walls. In one case of hydrosalpinx and ovarian tumor, the patient afterward had a cellulitis. This suppurated and was drained through the vagina and the ligature discharged. It has frequently happened in cases of pyosalpinx, where long-continued drainage was necessary. I have observed it very constantly in cases in which the pyosalpinx has already ruptured, or been on the point of rupturing into the bowel, these cases always requiring prolonged drainage.

"Ligatures of twisted silk, doubled figure-of-eight, were used. These have been cast off from two months to a year after operation. I never use heavy strands of gut, as there is considerable doubt as to our ability to disinfect them satisfactorily. In all cases there has been drainage from four to five days. I clean the tube at intervals not longer than twelve hours. No sort of antiseptic injections are ever used in any of my abdominal sections."

Dr. Kelly's remark regarding the use of heavy strands of catgut seems of importance. We are never sure of healthy membrane, hence in spite of antiseptic precautions we may often use septic gut. Dr. Matthew D. Mann's statement that gut shrinks one-tenth its length when wet with water should be considered in tying, since too much pressure may cause some necrosis of the stump.

The causes of fistulæ may be summarized as follows: (1) Adhesion to the bowel which, in being loosened, may cause thinning and subsequent sloughing. (2) Heavy ligatures on small stumps. (3) Ends of ligature left too long. (4) Ligatures not thoroughly aseptic. (5) Part of the stump consisting of unhealthy tissue. (6) Prolonged use of the drainage-tube, which may cause localized inflammation, resulting in abscess of the stump or surrounding tissue.

Drainage, however, seems too valuable an aid to discard lightly, for we may meet with serious difficulties in closing the abdomen where there is danger of oozing of blood, which may accumulate and decompose, giving rise to troublesome secondary symptoms.

Among the secondary adhesions most commonly found may be mentioned omental and intestinal adhesions with the stump or abdominal incision as a focus. Such a case was reported by E. Sinclair Stevenson before the British Gynecological Society, April 24, 1889. In this case intestinal obstruction called for a second operation, the omentum was found twisted like a loose rope, dipping into the abdominal cavity, glued to coils of intestine, and its extremity firmly attached to a deeply-seated coil. The importance of carefully inspecting torn surfaces of omentum or peritoneum and obviating adhesions by stitch or removal, spreading out the omentum toward the left just before tying the abdominal sutures, becomes at once manifest.

Omentum caught in the holes of the drainage-tube, is another unpleasant complication, but can be avoided by using tubes of small calibre with small perforations, as advocated by Dr. Joseph Price.

Intestinal adhesions to the stump or to surfaces of torn adhesions are best overcome by free purgation and the avoidance of opium.

Painful stumps may be due to an uncovered ligature, to unhealthy tissue left in the stump, or, as Dr. B. C. Hirst has shown us, by too much ligature and an unfinished operation.

This brings us to the last point of importance, namely, unfinished operations. With this I had an unpleasant experience in two cases some years ago, and have profited by it. In one case a pus-tube was so tightly adherent to the pelvic walls and uterus that my courage failed me, and contenting myself with removal from one side I closed the abdomen. Three months later my patient had a sharp attack of septic peritonitis, and she died five months after this, her abdomen literally filled with multiple abscesses. The second unfinished case was of a similar nature, though not so far advanced; the adhesions again intimidated me; the patient recovered promptly, and in spite of hot July weather was temporarily relieved. The following winter I was called to treat a localized peritonitis on the side where I left the pus-tube. She recovered, but has since passed out of my hands. I have learned that to open an abdomen and leave pus there, is as harmful as to know of the presence of pus and not

[1] On page 17.

[2] Buffalo Medical and Surgical Journal, April, 1890.

attempt its removal. I have since endeavored to remove the cause of sepsis, even though the ideal operation was out of the question, and the results have been more satisfactory.

This leads me to an important question which has agitated my mind of late, and which is best illustrated by a brief account of two cases from my practice, both unilateral hydrosalpinx. In both I removed the affected tube and ovary—one in March, 1887, the other in February, 1888, the remaining appendages being apparently normal. Both recovered promptly and improved in health. But in each the former symptoms returned on the other side in eighteen and six months respectively.

The first case reported again three months ago, and I found a painful mass on right side. She at once made preparations for a second operation, which was performed in March, 1890. Some omental adhesions to the incision were found; the tube and ovary were adherent and cystic; the stump was healthy. Patient recovered promptly, and it is now seven weeks since the operation; no pelvic pains; intestinal functions normal.

In the second case operation was performed on May 9, 1890. There were omental adhesions to the abdominal wall and intestinal adhesions to the stump. The uterus, abdominal wall, ovary, and tube were adherent. There was decided constriction of the tube near the ostium internum. I removed the tube and cystic ovary and separated all adhesions except those to the stump.

May 18. Patient doing well.

This leads to the question: Is it the proper course to remove an apparently normal ovary and tube when there is hydrosalpinx on one side, or shall we let the patient run the possible risk of a second operation?

Is there the same danger as in pyosalpinx? Should this last question receive an affirmative answer it certainly behooves us to explain such dangers fully to the patient and gain her consent to remove, if necessary, even an apparently healthy ovary and tube, so that she may not be exposed to the dangers of a second operation.

REMARKS ON THOMSEN'S DISEASE, WITH REPORT OF A CASE.[1]

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IT is scarcely necessary to enter upon an extended consideration of the literature of this subject, as all that was previously known of this disease was admirably summarized in the monograph of Professor Erb, published in the early part of the year 1886.[2] In this article Professor Erb states that he believes the disease to be a tropho-neurosis of the muscles, forming a definite clinical group with characteristic symptoms. In January, 1886, an article by Dr. Allan McLane Hamilton[1] denies this conclusion and states that the peculiar symptom-complex termed Thomsen's disease is frequently found in other diseases, particularly in hystero-organic disorders, and in the third stage of posterior spinal sclerosis, and is by no means uncommonly associated with coarse cerebral lesions. He regards it as in most cases a purely psychic disorder, which depends first upon inhibitory insufficiency, and secondly, upon an unstable emotional state, which interferes with the origin of proper volitional mandates. In support of his views Dr. Hamilton describes several cases, in two of which the symptom of muscle stiffness was present, associated with other nerve lesions. The third case was evidently one of hysteria complicating a fairly well marked case of paralysis agitans.

That the symptom of spasm at the inception of voluntary impulse does not alone constitute Thomsen's disease will hardly be denied, and that it may be occasionally associated with other organic lesions, would seem to be attested by Dr. Hamilton's cases; that it occurs as frequently as he thinks it does, I am inclined to doubt, as it has never come to my notice in a not inconsiderable neurological practice.

Erb divides the cases so far reported into typical, doubtful, and symptomatic. In typical cases the lesion is always confined to the voluntary muscles, begins in early childhood, and probably in many cases is congenital. It is usually hereditary or appears in families with a strong neurotic taint. The majority of cases so far reported have one or more relatives affected with the same disease. The disease is characterized by a peculiar stiffness and cramp in the muscles, which comes on with the inception of voluntary motion and which, after a time, gives way and permits the performance of the contemplated movement. After a certain number of repetitions the movements become easier, and the cramp, which is painless, disappears. The contractions are always increased by cold and mental excitement. The muscles are commonly well developed, and elastic, but they do not contract as strongly as in health. The electrical reactions are changed and, according to Erb, consist in an increase in the excitability of the muscles and a response, normal or diminished, to the stimulation of the nerve, with both currents. The galvanic current gives a qualitative change, in that the ACC is prompter and stronger than CCC. All contractions last several seconds after the stimulus is withdrawn. Erb found in several of his cases considerable hypertrophy of the muscular fibres, with increase in the nuclei, changes in the

[1] Read before the Chicago Medical Society, June 16, 1890.

[2] Die Thomsensche Krankheit (Myotonia Congenita) Studien von Prof. W. Erb, Leipzig 1886.

[1] Medical Record, 1886, vol. i. p. 85.

finer structure, and a slight increase in the interstitial connective tissue.

While the histories of these cases are sufficiently clear to warrant us in assuming that we have here a pathological entity, yet I am not sure that the disease does not also occur later in life, in the so-called adult forms. It is possible that at least some of these cases can be classed as true examples of the disease, particularly those of Schonfeld's, Seligmüller's and Engel's.

The following is perhaps the most clearly marked of all the adult cases thus far described :

W. H., of Arkansas, aged twenty-five, presented himself in January, 1884. Notes made at that time are as follows: The family history shows that his father died of consumption at the age of thirty-two, and that his mother was killed by an accident at about the same age. The paternal grandparents are still living at an advanced age, and are in good health. Maternal grandfather still living, aged seventy-eight. Maternal grandmother died of erysiplas at an advanced age. Patient is the second child. He has one brother and two sisters living and well. They have never been affected with any disease similar to that of the patient, and no neurotic trouble has ever been observed in the patient's family. He has always had the best of health. Has used tobacco excessively, but alcohol only occasionally and in small quantities. Is married and has one child. There is no evidence of venereal disease. Has worked hard since his seventeenth year as a sailor, fireman and an engineer, and in these occupations was exposed to varying and extreme temperatures.

About two years ago he was employed in a nail factory, and at that time he noticed the first symptoms of his present trouble. The work required him to stand in front of his machine and to make constant and rapid flexion and extension of the forearms, at the same time stepping from side to side. The first symptom noticed was a slight stiffness, first on one side, then on the other. For a time these symptoms would cease only to recur again at varying intervals of from a few days to a couple of weeks, but with ever increasing severity. Finally the patient had to give up his employment, owing to the lessened control over his muscles. When grasping anything it was impossible for him to loosen his hold promptly, and he experienced great uncertainty in attempting to walk, as he was likely to fall on his face owing to the flexion of the legs. He now rises very slowly from the chair, and walks with a hesitating gait until he has taken a few strides. The contractions often persist for ten or fifteen seconds, and are always aggravated by cold and mental excitement. The patient has a fine physique and the muscles are exceptionally well developed; indeed, from their volume and firmness he would be considered quite an athlete. The peculiar condition is absent on rising in the morning, but after he he has been up for a few minutes the contractions begin and seem to increase until after working a few hours, when they decrease. Since changing his work to that of a night watchman, the disease has not been so severe. All the nervous functions except motility are perfectly intact. The reflexes are normal, and the patient eats and sleeps well and has not the slightest pain. The muscles of the face and of mastication are intact. The voice and mental characteristics are unchanged. Electrical excitation of the muscles is followed by a long contraction which persists some seconds after the current is broken. The qualitative reactions described by Erb had not at that time been pointed out, but it is possible that they might have been found had they been looked for. The size and appearance of the muscles also indicated that the peculiar muscular changes had come on; and while they appeared strong, they were not actually so, as their voluntary contractions were much weaker than would be expected.

The fact mentioned by this patient that immediately after leaving the bed in the morning he gets about much more easily than later in the day, was also observed in one of the typical cases described by Bernhardt.[1]

While we cannot draw definite conclusions from a single case, yet the history of this patient teaches that Thomsen's disease may occur in adults without special neurotic heredity, and from causes competent to produce other forms of nervous disorder.

Unfortunately, this individual was only a short time under observation. All possible means have been used to learn his subsequent history, but thus far without success.

MEDICAL PROGRESS.

The Treatment of Injuries of the Urethra.—DR. HAEGLER has made a series of experiments on dogs to elucidate the proper method of dealing with wounds of the urethra (*Deutsche Zeitschrift f. Chirurgie*). His conclusions are as follows:

1. After extensive rupture of the urethra external urethrotomy should be done at once, and the ends of the torn urethra sutured. The edges of the wound cannot, however, be always closely united.

2. The suture should be introduced as far as possible into the submucous tissue, and during the first twenty-four or forty-eight hours a catheter should remain in the urethra, the perineal wound being open.

3. Bougies should not be used until the wound has completely healed.—*Annals of Surgery*, July, 1890.

Rhinoscleroma.—WOLKOWITSCH defines rhinoscleroma as a disease localized in the mucous membrane of the nose and surrounding skin, characterized by hard proliferations, by an exceedingly chronic course, and by being absolutely incurable (*Centralblatt f. Chirurgie*, June 7, 1890). Cases have been reported from Austria, Italy, Russia, Central America, Cairo, Switzerland, and Sweden. The disease begins with few symptoms, most frequently in the nasal cavities, but occasionally in the

[1] Centralblatt für Nervenheilkunde, 1885, p. 124.

fauces and larynx, and one case is reported in which it began on the hard palate. Wherever the disease begins the nasal cavity is soon involved. The macroscopic alterations are the formation of more or less circumscribed nodules, tubercles, and plates, involving the deeper layer of the skin and mucous membrane, and with marked swelling around them. Occasionally the nodes atrophy, the connective tissue contracting in consequence and causing distortion, and sometimes interfering with respiration. The swellings never ulcerate unless antisyphilitic treatment is used. The symptoms are few; pain is almost entirely absent; there are the usual symptoms of nasal catarrh, and if the larynx is involved, dyspnœa may become a prominent and serious symptom. The course of the disease is very slow, lasting in one case for twenty-six years. No treatment save excision of the nodules seems of the slightest use. Histologically the growth consists chiefly of a small-cell infiltrate. Microörganisms resembling the pneumococcus are invariably found.

Treatment of Sciatica and other Neuralgias.—MORDHORST (*Therapeutische Monatshefte*, June, 1890) states that the diagnosis of sciatica is not always easy, and that inflammatory thickening of the rectus femoris and vastus externus may be mistaken for this condition. It may also be confounded with rheumatic affections of the trochanter major and the muscles covering the hip-joint, especially the tensor vaginæ femoris, in the tendon of which may be found small masses varying in size from a lentil to a bean. These may be mistaken for true *punctata dolorosa*, as they are painful upon pressure. In many of these cases the author has found an excess of free uric acid in the urine, and so concludes that these masses are urates deposited in the tissues.

With these few remarks on diagnosis, the author takes up his special methods of treating sciatica, which he has employed for the past four years, and for which he claims the best results. In cases of neuritis—most of these cases belong to that class—it is well, he says, to begin with a hot bath of from fifteen minutes to one hour's duration, followed by rest in bed of at least one hour, after which electric massage is to be used after the author's method. This consists of the application of the cathodal electrode having a surface area of at least 100 square cm. to the sciatic notch, while a revolving cylinder connected with the anode is passed down the limb along the course of the nerves. Deep pressure is made when the electrode is drawn downward, but it should only touch the skin lightly when returned, to prevent a break in the current. The author says that strong currents (from 5 to 10 milliampères) can be used in this manner, with a corresponding rapid absorption of inflammatory exudate.

Of 36 cases of sciatica treated in this way, 30 recovered, and 6 were improved. One case was cured in eight days, but the average length of treatment was from three to six weeks. Of 13 other neuralgias, 10 were cured and 3 improved.—*Journal of the American Medical Association*, July 26, 1890.

Incompatibilities of Antipyrine.—The *American Druggist* gives a list of drugs with which antipyrine is incompatible. Among them are the following: Carbolic acid in strong solution, hydrocyanic acid, nitric acid, tannic acid, iodide of arsenic, chloral, sulphate of copper, decoction and fluid extract of cinchona, sulphate of iron, bichloride of mercury, infusion of uva ursi, solution of potassium permanganate, sodium salicylate (liquefies), spirit of nitrous ether, syrup of iodide of iron, tincture of chloride of iron, tincture of cinchona, tincture of catechu, tincture of iodine, tincture of kino, and tincture of rhubarb.—*Therapeutic Gazette*, July, 1890.

Intestinal Antisepsis.—CANTANI believes that the best method of applying antiseptics in the treatment of intestinal diseases is by rectal injection (*Wiener med. Blätter*, No. 22, 1890), experiments having shown that fluids given in this way reach not only the upper part of the intestines, but may even reach the stomach. If necessary, the reservoir may be raised two or three yards above the level of the rectum. If there is fever, the temperature can be reduced by using the solution cold; if collapse, as in cholera, the patient can be stimulated by using the solution warm or hot.

Cantani thinks the best antiseptic to use in this manner is tannic acid, which not only checks the multiplication of bacteria, but destroys the ptomaines. The solution should contain not more than one per cent. of tannic acid. In diarrhœa and dysentery this solution acts not only as a disinfectant, but also as an astringent. In typhoid fever, Mosler has found it very efficient in reducing tympany and checking diarrhœa.—*Medical Chronicle*, July, 1890.

Treatment of Snake-bites.—PROFESSOR KAUFMANN contributes to the *Revue Scientifique* a paper describing his recent researches and experiments regarding the bites of poisonous snakes. He advises that in the treatment of a bite the injured limb should be tightly bound above the bite, as quickly as possible, with a handkerchief or any other available constrictor, and that then a 1-to-2 solution of chromic acid should be injected deep into the wound, making several similar injections in the neighborhood of the wound. If these directions are carefully followed, the poison will be destroyed before being absorbed. If there is already much swelling of the wound, more injections should be made in various parts of the swelling, which should then be manipulated to bring the acid thoroughly in contact with the poison. The swelling should then be freely lanced and as much as possible of the fluid squeezed out. The skin should be washed with the chromic acid solution, followed by the application of compresses saturated with the solution. If the swelling returns, these procedures should be repeated.

This local treatment should be supplemented by the internal administration of alcoholic stimulants and aqua ammonia. Professor Kaufmann, however, strongly condemns the use of large quantities of alcohol, which, he thinks, paralyze and depress the nervous system.—*Indian Medical Gazette*, May, 1890.

Œdema Pulmonum.—GROSSMAN (*Zeitschrift für klinische Medicine*, Bd. 34, H. 1, 2, 3, 4, 1889; *Wiener klinische Wochenschrift*, April 2, 1889), in his remarkable experiments concerning œdema of the lungs, which have been carried out in the laboratory of Professor v. Basch, in Vienna, has made some important discoveries. An acute

general pulmonary œdema occurs in dogs, and not as hitherto supposed in rabbits alone, from obstruction of the left auricle and compression of the left ventricle. He has learned that the transudation plays but a secondary *rôle* in the causation of the dyspnœa, and that the most important obstruction to respiration is the inflexibility of the lung on account of the œdema. In consequence of the vascular engorgement there occurs an enlargement of the alveolar spaces, that is, an enlargement of the lungs. He considers transudation a factor of no importance in dyspnœa. We not only have congestion and œdema through muscarin intoxication, but also swelling and stiffness of the lungs and bronchial cramps. He thinks that his investigation prove the primary cause of the congestion of the lungs to be the narrowing of the left side of the heart, contrary to the theory of Conberm-Welch, who considers it due to paralysis of the left side of the heart.

Moyer (*Medical Standard*, September, 1889), in a recent discussion in the Chicago Pathological Society, took the stand against the majority of the members regarding the indications for pilocarpine in pulmonary œdema. His views meeting with scant support, he determined to try the drug in the first case that offered, where there were no heart complications or threatened coma. A case recently came under his care presenting these conditions,and the drug was administered with the most happy effect.

Fothergill's Anti-rheumatic Pills.—The late DR. FOTHERGILL used the following combination in a large proportion of his cases of chronic rheumatism:

℞.—Arsenious acid . . .	3 grains.
Powdered guaiac . . .	3 drachms.
Powdered capsicum . .	30 grains.
Pill of aloes and myrrh . .	3 drachms.

Mix, and divide in 120 pills. One pill was ordered three times a day, in connection with a diet rich in fatty foods. Also, a general tonic treatment was in most cases found advisable at the outset.

Treatment of Tympanites.—

℞.—Naphthol Carbonate of Magnesia Charcoal	of each 1½ drachms.
Essence of peppermint . .	10 drops.

Make into twelve powders, and take one every two hours until relief is obtained.—*Revue Obstétricale et Gynécologique*, July, 1890.

Creolin for Pruritus Vulvæ.—

Creolin	3 to 5 parts.
Linseed oil	100 parts.

Apply with friction to the affected parts every four or five hours.—*Revue Obstétricale et Gynécologique*, July, 1890.

Formula for the Administration of Creasote in Phthisis.—

℞.—Creasote	30 grains.
Rum	1½ ounces.
Syrup of tolu	1 ounce.
Distilled water . . .	2 ounces.

A dessertspoonful twice or thrice a day in a wineglassful of water, to persons having a tubercular tendency.—*L'Union Médicale*, July 5, 1890.

Mercurial Fumigation in Pseudo-membranous Laryngitis.—DR GEORGE E. LAW (*Brooklyn Medical Journal*, August, 1890) enthusiastically advocates mercurial fumigations in the treatment of pseudo-membranous laryngitis. His opinions are based on the results of treatment in seven cases, six of which recovered. Of the six, three had diphtheritic membrane in the pharynx in addition to that in the larynx, and paralysis followed in one.

The apparatus used by Dr. Law consists of a tent, and an alcohol lamp with arms to support a piece of sheet-iron. The tent may be improvised by fastening a bed-slat to each post of the child's crib, connecting them by cross-pieces, and throwing a sheet over this frame-work. The lamp is then lighted, and, when the sheet-iron plate is hot, thirty grains of calomel are dropped upon it, and the apparatus quickly placed in the tent. The duration of the fumigation should be about ten minutes. The procedure should be repeated at first every two hours, increasing the intervals as the symptoms diminish. Attendants must be cautioned not to inhale the fumes, as there is danger of mercurial poisoning, though this danger does not seem to exist in patients suffering from pseudo-membranous laryngitis.

Hot Enemata in Typhoid Fever.—Following the suggestion by Professor I. T. Tchüdnovsky, DR. THEODOR K. GEISSLER, of St. Petersburg (*Vratch*, No. 22, 1890), has undertaken an experimental inquiry into the action of hot enemata on patients suffering from enteric fever. In all, five cases (males, aged from fifteen to twenty-nine years) were selected for the purpose, each experiment lasting eight days, and being divided into two periods of an equal duration, during one of which the patients received daily (at 11 A.M.) an enema of one quart of water at 108.5° F. The essential results of the researches are as follows: (1) Hot enemata manifest a very favorable influence on the intestinal tract in typhoid fever. In cases of diarrhœa, they markedly diminish the frequency of stools and improve their quality, the fæces becoming less fluid. The injections also relieve abdominal pain, and produce a beneficial action on constipation when present. (2) Immediately after an enema, the bodily temperature, as a rule, slightly rises. When examined an hour later, the temperature proves to be the same as, or even lower than, the temperature before the enema. (3) In the long run, the injections seem to promote defervescence, or, at least, the transformation of a continuous fever into a remittent or intermittent one. (4) Immediately after an enema, the frequency of the pulse commonly somewhat decreases, to increase at the end of an hour. At the same time, the pulse becomes firmer and fuller, its dicrotism less pronounced, and the cardiac contractions more vigorous. (5) The respiration usually quickens, but becomes slower in an hour or two. (6) The blood pressure distinctly rises. (7) The daily amount of urine increases, while the specific gravity sinks. (8) The enemata are invariably perfectly well borne, the patients being rather pleased with them, and a sensation of well-being always follows. As a rule, the injection is retained by the patient from twenty to thirty minutes.—*London Medical Recorder*, July, 1890.

THE MEDICAL NEWS.

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SATURDAY, AUGUST 16, 1890.

DELAYED LABOR FROM PROLAPSE AND OCCLUSION OF THE CERVIX.

A VERY frequent cause of delay during normal labor is prolongation of the anterior lip of the cervix produced by the presenting part, and its impaction between the head and the symphysis pubis. This minor complication is generally readily detected by the examining finger, and may be remedied by placing the woman upon her side, employing an anæsthetic if her suffering is severe, and, in the intervals between the pains, pushing the head a little upward and backward and carrying the projecting lip above the head with the finger until the commencement of the next pain. A few efforts in this way will generally result in the retraction of the cervix over the head and labor will go on naturally. It is sometimes observed with primiparæ that the cervix becomes excessively distended and that the external os remains very slightly dilated. The cervical tissue may become so thin as to resemble closely the membranes, and we recall a case in which the attending physician punctured this tissue with a probe, supposing that he was rupturing the membranes. In such a case the os uteri will be found near the posterior wall of the pelvis and can usually be dilated by the fingers or by a Barnes' bag.

It occasionally happens, however, that so firm is the tissue about the external os that the cervix containing the head becomes excessively thin, and projects between the woman's thighs. Such a case is described by Jentzer (*Archives de Tocologie*, May, 1890). The patient had been in the care of a midwife, but labor had been delayed. The physician was summoned with the statement that the cervix was dilated and obliterated; that the head was presenting, but that neither the cervix uteri nor the neck of the child above the head could be felt by the examining finger. On examination a tumor as large as the head, reddish in color and containing an opening about a third of an inch in diameter, was found projecting from the vulva. The occiput of the child had descended toward the mother's left side, rotation not having occurred. The patient was anæsthetized, the tissues at the borders of the os uteri were incised and dilatation was rapidly performed by the fingers, and the membranes were ruptured, but the child was found dead. While the midwife made counter-pressure upon the sides of the cervix, the child was delivered by traction without great difficulty. The cervix was easily replaced. Under antiseptic precautions the patient made an uninterrupted recovery. It is interesting to note that no history or evidence of prolapse occurring during pregnancy, or of endocervicitis, or any inflammatory disorder, could be obtained, and the cause for the complication remained unknown.

Martin, Latz and Auvard have reported similar cases. Quite recently in examining a patient seven months pregnant, we found great elongation of the cervix with prolapse and ulceration. It was necessary to replace the cervix and to maintain its position by antiseptic tampons renewed every second day.

It is not infrequent to find, in women giving a history of specific infection, such deposit of syphilitic tissue about the os and cervix as to make dilatation excessively difficult. In these cases profound anæsthesia, manual dilatation, and elastic dilators may be employed to advantage. As soon as a narrow-bladed forceps can be introduced the head may be brought down and dilatation completed, under anæsthesia, by the forceps. In a case of labor in which the first stage lasted seventy-two hours, it was necessary to complete delivery in this manner, and under antiseptic precautions mother and child recovered well.

Dührssen has recently advocated multiple inci-

sions in the cervix in delayed labor. While this procedure can hardly be thought devoid of danger, yet if caution be exercised to incise in many places but not deeply in any one, and if strict antiseptic precautions be observed, the lives of children can doubtless be saved by this expedient which otherwise must be lost through delay. The tampon of iodoform gauze furnishes a safe and reliable method of checking hæmorrhage should serious bleeding follow such dilatation.

REVIEWS.

TERMINOLOGIA MEDICA POLYGLOTTA: A CONCISE INTERNATIONAL DICTIONARY OF MEDICAL TERMS. Compiled by THEODORE MAXWELL, M.D. Camb.; B. Sc. Lond.; F.R.C.S. Edin. 8vo., pp. 459. Philadelphia: P. Blakiston, Son & Co., 1890.

THIS work represents an enormous amount of labor on the part of the compiler and his assistants, comprising, as it does, the French, Latin, English, German, Italian, Spanish, and Russian synonym of every medical term, and it is only owing to an exceedingly ingenious arrangement and the avoidance of descriptive definitions that the volume is not as large as an "Unabridged." French is selected as the key-language, but this fact in no way interferes with the usefulness of the book to a student who cannot read French. Suppose, for example, that an Italian in reading German comes to the word *zunge*, of which he wishes to know the meaning. Turning in this work to *zunge*, he finds the English, *tongue*, and French, *langue*. If, now, he is unfamiliar with the English and French words, he must turn to *langue*, under which he will find the synonyms in six languages, including that of his own. Again, suppose that an Englishman wishes the synonym for the Italian *malattia*. Turning to this word, he finds the English, *disease*, as well as the French, *maladie*, while a Spaniard would have to turn to the French heading, *maladie*, where he would find among the other synonyms his own word, *mal*. In other words, every medical term in seven languages has a separate heading (excepting the Russian, which has no separate headings) with the synonym of at least two other languages; and under the French heading the word is repeated in six languages.

The book is well bound and clearly printed, and, while we believe it will be welcome to a few students of foreign medical literature, and especially to medical editors, the number of physicians who are interested in the language of more than one country besides that of their own is so small, that we doubt if the compiler or publisher will ever be repaid for the labor and expense of preparation.

"The Lesson in Anatomy."—Referring to Rembrandt's celebrated picture, "The Lesson in Anatomy," the *Lancet* describes a curious anatomical error which is certainly not generally known. The pronator radii teres is drawn as if it ran from above downward and *in*ward from the radius to the ulna, instead of downward and *out*ward from the ulna to the radius.

SOCIETY PROCEEDINGS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, June 25, 1890.

THE PRESIDENT, JOHN B. ROBERTS, M.D., IN THE CHAIR.

DR. EDWARD JACKSON read a paper entited

THE RECOGNITION OF EYE-STRAIN BY THE GENERAL PRACTITIONER,

in which he dwelt on the futility of attempting to give relief from the symptoms of eye-strain by drugs, though they are frequently persisted in until the patient deserts his so-called medical adviser, and takes his chances with the specialist or the charlatan.

From time to time, he said, efforts have been made by ophthalmologists to secure a more general recognition of eye-strain on the part of the mass of the profession; but usually these efforts consist in a recommendation of some special instrument or procedure of diagnosis, as the refraction ophthalmoscope, or the shadow-test, or a set of trial lenses, reduced in size and price to the supposed needs of the mass of the profession. If it were really necessary to apply such special means of diagnosis in order to recognize the presence of eye-strain, there would be little prospect of its early general recognition. But the condition is frequently recognized by the patient himself, and the ophthalmic surgeon finds in the general rational symptoms sufficient grounds for a provisional diagnosis; and if the mind is clear from preconceived hypotheses as to the causes of the symptoms there is no reason why any one reasonably qualified for practice of general medicine should not be able to make a provisional diagnosis, in the great majority of cases, with sufficient certainty to serve for the basis of further investigation and treatment, without resort to any special method of examination. The speaker did not wish to underestimate the value of the ophthalmoscope to the general practitioner, for he did not regard anyone who is unable to use the ophthalmoscope as properly qualified for general practice, but he meant that inability to measure refraction with the ophthalmoscope is no reason for failing to recognize eye-strain.

The patient suffering from eye-strain comes with a certain history and certain complaints, which, carefully considered by the light of a very moderate knowledge of the subject, usually clearly indicate the cause of the trouble. The symptoms in question are:

(1) *Impairment of vision*, either quite temporary, more prolonged, or permanent. A very characteristic form of temporary impairment of vision is that due to sudden relaxation of the accommodation. This occurs when the ciliary muscle has long been overtaxed, and especially in the latter hours of the day, when the muscle is tired out. The patient notices that the print or other near object on which the attention is fixed suddenly becomes blurred, compelling the cessation of the eye-work. After a moment, however, the power of again focussing the object returns, and work can be resumed. The patient is apt to close his eyes for an instant, and, perhaps, rub them, and then finds the sight again restored. If the eye-work is continued, the failure of ac-

commodation recurs, to again rapidly pass away; and keeping on with the work, these periods of inability to see become more and more frequent, until, finally, they greatly interfere with the continuance of the work or quite prevent it. This form of impairment affects only the vision for near work.

Another form of temporary impairment is that due to spasm of the accommodation; it affects distant vision only, and is noticed chiefly by those whose distant vision is otherwise pretty good. It comes on after prolonged straining of the eye, usually for near vision, and lasts until the eye is rested. It is a valuable danger-signal, and should secure cessation from the work causing it until the symptom has disappeared. Permanent impairment of vision is brought about when eye-strain causes myopia or decided permanent damage of the choroid and retina.

(2) *Headache and aching of the eyes.* Eye-strain should be the first thought suggested by any complaint of headache, for in our day and civilization it is by far the most common cause of that symptom. It enters as a factor into the causation of nearly all headaches not due to pyrexia, toxæmia, or diseases of the brain or its membranes. Often it comes on whenever the eyes are used, and is absent when they have a proper period of rest. Very often a chronological connection between the use of the eye and the occurrence of the headache, although perfectly certain after it has been once observed, was not noted by the patient until his attention was directly called to it. Even when the headache is constant and apparently uninfluenced by variations in the amount of eye-work, it may be due wholly to eye-strain.

In hyperopia in young people the accommodation is in excessive use so long as the eyes are open and the attention fixed on any visible object; and hyperopia is the most common cause of constant headache. Dr. Jackson said that he himself was formerly subject to headache whenever confined to the house, and he believed it was caused by breathing vitiated air, until cured by the correction of his hyperopic astigmatism. Many persons have the same idea as to the causation of the headaches they experience when attending the theatre or other place of public amusement, and which are really due to eye-strain. Others ascribe these headaches, and those experienced in travelling or shopping, to exhaustion. This is nearer the truth, only they commonly have in mind a condition of general exhaustion, whereas it is largely one of local exhaustion of the special nervous apparatus concerned in the act of seeing.

The *location of the aching* is of some significance. Generally it is frontal, often described as beginning in the eye, or just back of the eye, or through the temples. Frequently it extends to the occipital region, and may sometimes be felt principally or wholly in that region. Headache most severe in the vertex or confined to that region is probably not very common from any cause, but from eye-strain it is almost unknown. Often the headache is more severe on one side of the head than the other. Sometimes it is entirely confined to one side, but usually it is bilateral.

Those more or less regularly periodical headaches, known as nervous or sick headaches, migraine, or, when confined to one side of the head, hemicrania, are in many cases caused by eye-strain and relieved by its removal. Attacks of this kind are frequently ushered in by certain interferences with vision and subjective sensations of light, affecting a part or the whole of the visual field, and known as ophthalmic migraine. These visual disturbances are simply a part of the general "nerve-storm," and it is not certain that they especially indicate eye-strain.

(3) *Congestion, irritability, or inflammation of the eyes and their appendages*, should always cause the suspicion of eye-strain. A single attack of this kind has no special significance, but repeated attacks of inflammation, or prolonged congestion or irritability, are exceedingly suggestive of a continuing cause; and the most common cause is eye-strain. Every case of chronic inflammation of the margins of the lids, or of recurring conjunctivitis, or repeated styes, should be carefully investigated for eye-strain. Persons when they begin to feel the effects of loss of accommodation in presbyopia or absolute hyperopia, suffer from repeated attacks of conjunctivitis, which they commonly ascribe to "taking cold in the eye," but which are cut short by use of the appropriate lenses, and which, if unchecked, would tend to establish a chronic catarrhal condition which is a constant discomfort to many elderly people.

Of course, these conditions of ocular congestion and inflammation will be recognized by the usual symptoms of redness, swelling, and itching, smarting, or burning pain. It should be noted that headache and these local inflammatory conditions are not usually presented by the same case. They may co-exist, but, more commonly, if one is decidedly present, the other is absent.

So far nothing has been mentioned of the diagnosis of eye-strain, but only the facts ascertained by questioning the patient, and from simple inspection of the eye. If, now, the physician's office contains—what every general practitioner's office should contain—a card of test-letters for accurately ascertaining the distant vision, and a card of fine print for ascertaining the near point of the eye, additional valuable evidence is easily obtainable. The trial of the distant vision will give indication of any considerable degree of myopia or astigmatism. But it must always be borne in mind that troublesome ametropia may be present without preventing perfect distant vision. The position of the near point, if farther from the patient's eye than his age would indicate, is pretty good evidence of strain of the accommodation. Evidence of strain of the external muscles of the eye, heterophoria, can be obtained by simply getting the patient to keep his eyes fixed on some object, near or distant, and covering one eye; then noting whether the covered eye deviates from its position of fixation, and especially whether it makes a quick movement to return to that position when it is uncovered.

To recapitulate briefly, the common symptoms of eye-strain are:

(1) Certain forms of impairment of vision.

(2) Headache, which is to be studied with reference to the times of its occurrence, and the parts of the head to which the aching is referred.

(3) Chronic or repeatedly recurring congestion or inflammation of the eye or its appendages.

And if to these symptoms are added the results of the simple tests of near and distant vision, and the evidence

of tendency of the eyes to deviate from their normal position when covered, a very good basis is furnished for the probable or provisional diagnosis of eye-strain, without recourse to any special apparatus or unusual diagnostic procedure. And in view of these facts there is no justification for the general practitioner who fails to recognize most of the numerous cases of eye-strain with which he is brought in contact.

In the discussion which followed, DR. GEORGE M. GOULD referred to other symptoms the result of eye-strain; namely, sleepiness after persistent reading; anorexia and dyspeptic symptoms; nervousness, choreic movements, and even true chorea, and car-sickness when travelling. All of these symptoms he has observed in his practice. With reference to testing the eyes by the general practitioner, he suggested the following simple plan: Have two test-cards, so that the patient will not learn and remember the letters. Let the physician first test distant vision with one of the test-cards; then instil homatropine. This will give perfect paralysis in three-quarters of an hour. Then retest with the other card. If vision has decreased, there is eye-strain, due to astigmatism or hypermetropia. Another practical point is, that if the patient is suffering with headache, he will be relieved by the application of the mydriatic.

DR. MARY E. ALLEN asked if, in these cases, the condition of the recti muscles has not something to do with the symptoms. In her own case she had suffered from eye-strain for a long time, with insufficiency of the recti muscles. She frequently had a feeling as though a blow had been struck against the eye. Her explanation of this was that, by a spasmodic contraction of the straight muscles, the elastic eyeball was suddenly drawn with force against the back of the orbit, giving the sensation of a blow.

In closing the discussion, DR. JACKSON said that his paper simply dealt with the *recognition* of eye-strain, and that he purposely considered only those symptoms most generally present, and had in mind the great mass of cases, not the exceptional ones, which, though in the aggregate many, still are proportionally few.

In his experience, myopia sometimes caused severe eye-strain. There is also the strain of convergence, and any inequality between the two eyes in the amount of myopia—and myopia is usually unequal—is very likely to cause eye-strain. The discovery of myopia should not, he thought, rule out the existence of eye-strain.

CORRESPONDENCE.

MEDICAL LAW IN THE STATE OF WASHINGTON.

To the Editor of THE MEDICAL NEWS,

SIR: The subject of medical legislation is one that has been considered, more or less, by all of our States, and when the framers of the Constitution of the new State of Washington met they designated as one subject for special legislation the practice of medicine. But before that there was a Territorial enactment to the effect that a physician, before entering practice, must register his diploma with the county auditor; or, if he had been practising for five years before the passage of the law, he should make a statement of the fact to the auditor in writing. This law became a dead letter, as no one paid any attention to its enforcement. As to all new and promising countries, a large flock of all kinds of quacks and itinerants came here.

When the Legislature of the new State met, a bill, known here as the "Powers bill," was introduced, which virtually left all in the hands of a board to be appointed by the Governor. But the bill provided that the board should be chosen from the ranks of the regular profession only, which was considered by the homœopaths, who are about one-eighth of the entire number of medical men in the State, a manifest injustice. After the passage of the bill, the Governor returned it with his veto attached.

Another bill, leaving out the objectionable features, was prepared, and provided that all persons, before practising medicine here, should be examined and licensed by a State board. The meetings of this board are held every six months only—July 1st and January 1st—and no provision is made whereby one entering the State between examinations can practise; he must wait for periods varying from one to six months.

According to his previously announced intention of giving the regular profession a minority representation, the Governor appointed on the board four regular practitioners, three homœopaths, a "physio-medic," and an eclectic. It was no more than was to be anticipated that a portion of the board should be composed of homœopaths, but now the profession consider that a burning insult has been committed against them in the appointment of a "physio-medic." It is difficult to learn what that class of men represents, and no one here knows. At the board meeting a homœopath was elected president, and, without reference to his medical beliefs, it must be said that a better president could not have been found. Although the proceedings of the board were conducted in harmony, the hearts of the "regulars" burned with a feeling of disgust, while the "irregulars" were, of course, well satisfied. With a little stratagem the latter gained their point, by a combine with the "physio-medic" and eclectic members, which enabled them to elect their candidate president of the board, and to place such other members as they pleased in office. The whole scheme was "cut and dried" before the board met, and the opening of the session was delayed so that the "irregulars" could perfect their plans.

The board adopted rules to the effect that a general average of 65 must be made by all but old graduates (of at least five years' standing), who need not average as high in chemistry, physiology, or anatomy as graduates of less than five years' standing. At this meeting each man was given subjects to prepare questions upon.

The examinations were held July 1, 1890, at Walla Walla, when ten men presented themselves, among them your correspondent; and but one man, a homœopathist who graduated in March of this year, failed. The examination was entirely a written one, and was a perfectly fair test of our medical knowledge. There were one hundred and fifty-six questions—viz.: five each on Diseases of the Eye and Ear; ten each on Medical Jurisprudence, Surgery, Histology, Preventive Medicine, Practice, Diseases of the Nervous System, Anatomy, Materia Medica and Therapeutics, Diseases of Women, and Diseases of Children. On Obstetrics there were eleven

questions; on Chemistry fifteen, and on Physiology twenty. On Materia Medica there were two sets of questions, one for the homœopaths and one for the regular practitioners, and the other schools would have had the same privilege had any candidates applied. Two days were consumed in this work.

Laying aside all prejudices, a perusal of some of the questions of the "physio-medic" and eclectic members will show the injustice of having men of that class on the board. During the examination the writer carefully copied the questions, and, in some instances, the spelling—for the question-sheets came to us in the handwriting of the members by whom they had been prepared. The "physio-medic" asked, "What is *pertusses?*" and also the very comprehensive question, "What does delayed dentition prognosticate?" To this last I could not answer, nor could the two or three members of the board, to whom I afterward repeated the question. In Diseases of Women he questioned upon "*leucarrhœa*," "*amenarrhœa*," and "*dysmenarrhœa.*" Other questions of his were, "Define *mamary absess*," and "What is pelvic *absess?*" while the last question was upon "lacerated *peroneum.*"

The eclectic prepared questions on anatomy and physiology, one of which read as follows: "Name the divisions of the abdominal *aorta*, large branches, and from where *does* the lower extremities derive *there* blood-supply?" Another asked, "What 's the *peremtory* condition of pepsin in the stomach?" to which we afterward discovered he wished us to answer "Hydrochloric acid." Another question was, "What 's the effect of *too much* red corpuscles in the blood?"

Under the heading of Preventive Medicine, in the list of questions prepared by a homœopath, we found two as follows: "What means would you take to resuscitate from an overdose of chloroform?" and "How would you treat a case of poisoning from opium or morphia?" He evidently looks at the subject broadly, and thinks that any means of preventing death should be placed under the head of preventive medicine.

The examination, as a whole, was rigid, and a good test of a man's ability to practise medicine. I was recently informed by a member of the board that the examinations would be made still more severe.

Of all classes of practitioners we have a superabundance, and had the Legislature framed this law so that all men practising medicine in the State of Washington at the time of the passage of this act must come up for examination, the effect would have been excellent.

When I first came to Seattle, a place of 35,000 people, I was told that there were two hundred and fifty physicians here, which is about twice as many as the actual number. Both here and in Tacoma some homœopaths have the largest practice.

It seemed to me ridiculous that we should be required to go before a board in which the representation of the so-called schools was so unequal, but still more when I read the list of questions of the "physio-medic."

There is a class who refuse to pay attention to this law, and another class who were here in sufficient time to register, but neglected to do so, and are inclined to cause trouble.

SEATTLE, WASHINGTON.

NEWS ITEMS.

Surgeon Parke on Vaccination.—At the great banquet of welcome given in London to Surgeon Parke, he briefly referred to the inestimable benefit of vaccination. Before the expedition started for Africa he vaccinated nearly every man in Stanley's little army, with the result that when they were surrounded by smallpox there were only four cases among the members of the expedition, none of which proved fatal. But among the camp-followers and irregulars, who had not been vaccinated, smallpox was almost universal, and large numbers of them died. It is probable that, without the precaution of vaccination, the expedition would never have had strength to complete the march across Africa.

A New Method of Advertising.—According to the *Boston Medical and Surgical Journal*, for some time past complaints have made to the Health Commissioners of Brooklyn, New York, of the persistence with which mothers of very young infants are besieged by agents of the manufacturers of infant-foods. Most of the complainants were physicians who said that they had been requested by their patients to take measures to prevent the annoyance. Investigation resulted in the discovery that one of the clerks of the Bureau of Vital Statistics had been communicating the name and address to the manufacturers of the infant-foods, of every recently confined woman. The clerk was, of course, well paid for his information.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM AUGUST 5 TO AUGUST 11, 1890.

By direction of the Acting Secretary of War, WILLIAM STEPHENSON, *Captain and Assistant Surgeon*, now on duty at Columbus Barracks, Ohio, is assigned to temporary duty at Jefferson Barracks, Missouri, during the absence on leave of Daniel G. Caldwell, Major and Surgeon, and will report accordingly. On the return to duty of Major Caldwell, Captain Stephenson will rejoin his proper station.—Par. 2, *S. O. 176, A. G. O., Washington, D. C.*, July 30, 1890.

By direction of the Acting Secretary of War, leave of absence for one month and fifteen days, to take effect about August 15, 1890, is granted to DANIEL G. CALDWELL, *Major and Surgeon*, —Par. 1, *S. O. 176, A. G. O., Washington, D. C.*, July 30, 1890.

By direction of the Secretary of War, the ordinary leave of absence granted to JAMES P. KIMBALL, *Major and Surgeon*, in S. O. 152. July 1, 1890, from this office, is changed to leave of absence on surgeon's certificate of disability, with permission to leave the Division of the Missouri.—Par. 7, *S. O. 182, A. G. O.*, August 6, 1890.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY FOR THE WEEK ENDING AUGUST 9, 1890.

WALES, P. S., *Medical Director.*—Ordered in charge of the Museum of Hygiene, Washington, D. C.

BRIGHT, GEORGE A., *Surgeon.*—Ordered to the U. S. S. "Constellation."

MACKIE, B S, *Surgeon.*—Detached from the U. S. S. "Constellation," and ordered to Naval Hospital, Philadelphia, for medical treatment.

DERR, E. Z., *Surgeon.*—Ordered to the U. S. S. "Minnesota."

WAGGENER, J. R., *Surgeon.*—Detached from the U. S. S. "Minnesota," and ordered to the U. S. S. "Kearsarge."

MOORE, A. M., *Surgeon* —Detached from the U. S. S. "Kearsarge," and granted three months' sick-leave.